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THE CONCENTRATION AND DRYING OF PLASMA

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During the past few months the efficacy of plasma transfusions in the treatment of certain conditions, and especially in cases of shock and burns, has resulted in the formation of plasma storage banks. Consequently much interest has now developed in the possible use of dried plasma, since it is known that if the desiccation is carried out under suitable conditions the resulting powder redissolves in distilled water, reconstituting the original plasma.

Advantages of Dried Plasma

Several advantages are claimed for such a dried product. They are:

1. *Stability.*—Many experiments on proteins, including antitoxins, etc., have shown that dried protein material stored *in vacuo* can be kept for very long periods without any demonstrable changes in properties. Thus it is probable that the dried plasma proteins can be kept almost indefinitely even at room temperature. "Liquid" plasma is, of course, relatively stable at room temperature and keeps well, especially if it is placed in the dark; but for prolonged storage a refrigerator is technically desirable, although not essential.

2. *Economy of Storage Place.*—Five to ten times the amount of plasma can be kept in a given space if it is in the dried form, and this is a matter of great importance when considering the refrigerator or storage space available in a large blood bank. It must, however, be stored in appropriately small containers.

3. *Ease of Transport.*—The stability of the dried product at room temperature and its smaller bulk are of importance, since the transport of large volumes of water and the necessity for mobile refrigerating units are avoided.

4. *Preparation of Concentrated Plasma.*—Recent work has shown that there may be many advantages in the use of concentrated plasma, which can readily be obtained by dissolving the plasma powder in sterile distilled water to give the required concentration.

On the other hand, we must offset against the above advantages the difficulties and expense of the drying process, the relative stability of ordinary liquid plasma, and the fact that in many centres there will be a sufficiently rapid turnover of plasma in the bank to discount the necessity for storage for more than a few weeks. Nevertheless dried plasma is undoubtedly of use in wartime for building up local reserves and for transport by sea and air in response to emergency demands, provided adequate facilities exist for reconstituting the plasma when required. Its use as a source of concentrated plasma may become much more widespread when further clinical reports are considered.

Methods Available for Drying Plasma

Any method for drying plasma must fulfil certain conditions:

1. *Temperature Control.*—The drying must be carried out at a low temperature, in no circumstances greater than 37° C. and if possible below 0° C., so that denaturation of the plasma proteins cannot take place. It may be observed that denaturation is one of the most rapid of chemical reactions: whereas the speed of most reactions is doubled with a 10° C. rise of temperature the rate of denaturation is increased at a much greater rate (Schmidt, 1938). Even a small amount of denaturation renders plasma unsuitable for clinical use, and therefore it is impossible to place too much stress on the necessity for adequate temperature control of the drying process.

2. *Solubility.*—The dried product must dissolve readily and completely in sterile distilled water. The speed of solution appears to be related to some extent to the temperature of the final drying process: plasma dried from the frozen state usually yields a bulky porous powder which is readily soluble in water.

3. *Sterility.*—The dried plasma powder must be sterile. Sterility is achieved usually by obtaining plasma from blood under sterile conditions or by subsequent sterilization through a Seitz filter; the plasma is then kept sterile during the drying process and the powder must be sealed off in the vessel in which it is dried or, alternatively, transferred with suitable aseptic precautions to storage ampoules. If the plasma is dried and stored in its original container no economy of storage or transport space is effected. The problem of sterility is undoubtedly a difficult one.

The above conditions are necessary whatever the scale of the process, but when large volumes have to be dried certain other factors also assume importance. The plasma should be dried as rapidly as possible, with the minimum of labour and attention and the minimum capital outlay and running expenses.

In the method of drying developed by Flosdorf and Mudd (1935) for the production of lyophil serum the serum is frozen in ampoules and the water is distilled off under high vacuum into a vessel cooled in solid

carbon dioxide and methyl cellosolve (temperature about −70° C.). This type of apparatus is in general use in bacteriological laboratories, and in the simple form it is capable of drying about 100 c.cm. in ampoules in each twenty-four hours. Forms of this apparatus to deal with much larger quantities have been described. Later Flosdorf and Mudd (1938) developed their "cryochem" process, in which the frozen serum was subjected to a high vacuum, the water being distilled over and absorbed in specially prepared calcium sulphate. For the desiccation of 1 litre of serum 100 lb. of calcium sulphate is required, but this can be regenerated under suitable conditions. Knox (1939) has used a method similar to the lyophil method for the desiccation of various biological materials, and in his apparatus the rate of removal of the moisture appears to be about 100 c.cm. in twenty-four hours.

Greaves and Adair (1936) have described a simple method for the desiccation of small amounts of serum, using a high vacuum and phosphorus pentoxide as a desiccant; later (1939) they described a large-scale apparatus which is capable of drying 5 litres, either in bulk or in ampoules, the serum being frozen and the moisture distilled into a condensing system cooled with refrigerator coils at −45° C. Their paper contains a very full description of the physico-chemical aspects of the drying process. From the accounts given by the different workers it would appear that there is no difficulty in producing small amounts of sterile dried serum on a laboratory scale, but the drying of large volumes requires considerable capital expenditure in apparatus.

The above methods, which were all developed for the desiccation of serum, can also be employed with plasma.

In view of the possible importance of dried plasma or serum under the present emergency conditions it seemed desirable to investigate the subject further, the object being to devise a method for the concentration and drying of relatively large volumes with an apparatus that could be operated simply and cheaply in connexion with any blood bank.

Recently Edwards *et al.* (1940) have described a method of drying based upon the method of spray distillation *in vacuo*. Our own experiments have been founded on a similar principle and also on the principle of evaporation through a cellophane membrane.

Concentration and Drying of Plasma by Spray Distillation in Vacuo

We have been concentrating large volumes of liquids at temperatures below 37° C., using the Reich apparatus, and this appeared to offer certain advantages over the apparatus of Edwards *et al.* for the concentration and desiccation of plasma. The apparatus shown in Fig. 1 is similar to that designed by Reich, except that the double glass water-pump has been replaced by a highly efficient water-pump made from a modified steam injector. Part of the apparatus (from D to K) was sterilized by autoclaving and was then attached to the condenser (B) and to a bottle of sterile plasma (L). The water bath surrounding the flask (J) was heated to 80° C. and the plasma was drawn slowly in a fine spray into the distillation flask. In the initial stages the rate of evaporation was so great that despite the high external temperature the temperature inside the flask never rose above 20° C. Careful control of the rate of inflow was necessary to check the violent frothing which took place owing to the liberation of dissolved gases. It is desirable to have the minimal amount of fluid in the flask and to modify the rate of inflow to equal the rate of distillation. In the final stages of drying the diminished rate of evaporation resulted in a smaller temperature gradient between the two surfaces of the distillation flask, and the water bath was accordingly cooled at 35° C.

In this way 500 c.cm. of plasma was concentrated to about 50 c.cm. in thirty minutes (bath temperature 80° C.), and the concentrate was then reduced to a dry solid in a further sixty minutes (bath temperature 35° C.). The flask was then disconnected from the apparatus, plugged with sterile wool, and well shaken to break up the dried solid adhering to its walls (this is facilitated by the addition of sterile beads to the flask). In this and similar experiments yields of 8 to 10 grammes of solid were obtained from 100 c.cm. of plasma. The light yellow solid so obtained is readily soluble in sterile distilled water, giving a clear solution similar to the original plasma.

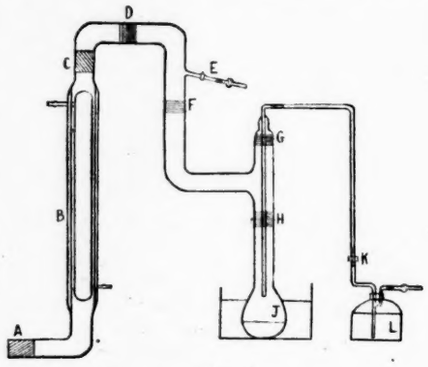

FIG. 1

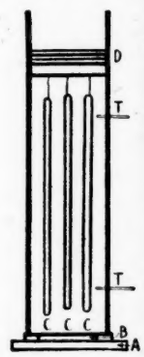

FIG. 2

FIG. 1.—A, Rubber connexion to pump. B, Double-walled condenser. C, Rubber connexion. D, F, G, H, Ground-glass joints. E, Tap and sterile filter. J, 500-c.cm. distillation flask. K, Tap and screw clip. L, Plasma.

FIG. 2.—A, Hot-plate. B, Air inlet. C, Cellophane tubes. D, Fan. T, Thermometers.

Although the results obtained were satisfactory the method was not without its difficulties. Constant attention was required to control the rate of spraying and the external temperature. The frothing in the initial stages was troublesome, but it can be controlled in large part by preliminary degassing, as suggested by Hartley (1936). It was found necessary to limit each batch to 500 c.cm. of plasma with the flask employed (500 c.cm.), as with larger amounts the layer of material in the flask did not dry easily. Undoubtedly one of the main drawbacks to the method is the necessity for resterilizing the apparatus after each batch of 500 c.cm. Thus the apparatus, in its simple form at any rate, is not suitable for operation with very large volumes of plasma.

The difficulties of temperature control can be overcome to some extent by a modification of the condenser, enabling it to be cooled with solid carbon dioxide in a solvent or by refrigerator coils. Alternatively the flask containing the concentrated material can be removed under sterile conditions and attached to a manifold of the Flosdorf–Mudd type of apparatus. With either of these modifications the dried plasma has to be removed from the 500-c.cm. distillation flask, which is unsuitable as a storage vessel.

In order to overcome some of the difficulties in the above process we have carried out the drying in two stages. In the first of these the plasma was concentrated to one-quarter or one-fifth of its volume in the Reich apparatus as above, but without special sterile precautions. In the second stage the concentrate was sterilized by passage through a Seitz filter, collected in batches in sterile ampoules, and dried, as described later, using the Flosdorf–Mudd lyophil technique. We have prepared dried plasma by this technique, but the rate of filtration

of concentrated plasma varies greatly from one batch to another (probably on account of the variations in fat content), making such a process unsatisfactory as a routine procedure. While investigating this matter further we tried out a different and simpler technique, described below, by which the plasma can be concentrated under sterile conditions.

Concentration and Drying of Plasma by the Cellophane Tube Method

The process of dialysis depending on the passage of water and other substances of low molecular weight through a cellophane membrane is a familiar laboratory process; it does not appear to be so well known that when a cellophane bag containing a solution is suspended in air a rapid concentration of the solution takes place, due to the passage of fluid through the membrane followed by evaporation at the surface. This phenomenon was first described by Kober (1917, 1918), and it has been used for concentrating various biological solutions, including serum (Thalhimer, 1938; Terry, 1939).

We have applied this method to the concentration of plasma. Cellophane tubing 2.6 cm. in diameter was cut into 100-cm. lengths and one end of each was tied tightly with fine string or thread. Into the other end a 5-cm. length of glass tubing of slightly smaller diameter was inserted and similarly tied. The glass was covered with grease-proof paper and the whole apparatus was sterilized by autoclaving for thirty minutes at 15 lb. pressure. After being allowed to cool the cellophane tube was suspended, sterile plasma was poured in through the glass tube, and the cellophane was then tied off a few centimetres below the glass, which was now cut off. A number of such tubes were suspended in a current of warm air as shown in Fig. 2. The temperature at the bottom of the tube was not allowed to exceed 35° C.; at the top it was considerably less, while inside the cellophane tube it was 5° to 10° C. less than the corresponding external temperature, due to the cooling effect of evaporation.

In this way 500 c.cm. of plasma in each tube was concentrated to about 100 c.cm. in forty-eight hours. During the process the more concentrated material settled to the bottom, and it was therefore of advantage to invert the tubes occasionally. The sterile plasma, thus concentrated to 20% of its original volume and containing 50% of solid, was either stored for clinical use or dried by the Flosdorf–Mudd lyophil method.

Some experiments were carried out in which the process of concentration was continued further to obtain a dry product. A resin-like solid was obtained, as compared with the porous powder which resulted from the other methods. This solid did not appear to be perfectly dry, and some difficulty was experienced in removing it from the tube. Various modifications of the apparatus, including one wherein the cellophane tube can be rotated horizontally, have been tried to improve the final product.

The cellophane tube method appears to be more suitable for the preparation of concentrated plasma and serum rather than of a dry product, and for this purpose it possesses many advantages over other methods. The apparatus is simple and cheap and can be installed in any laboratory on almost any scale. Unlike some of the other methods proposed, it involves little capital outlay, little personal attention is required during the process, and the running costs are low. As cellophane will not allow large molecules to pass through there is no danger of bacterial contamination during the process of concentration, providing sterile precautions are taken at the beginning and the ends of the tubes are tightly sealed. The rate of evaporation depends upon a number of factors, the most important being the surface area of the tube, the external temperature, the humidity of the air, the efficiency of the fan, and the thickness and porosity of the cellophane. The rate given above can be increased by using tubing of smaller diameter, but this may not be so convenient. A simple method of setting up a large battery of tubes is to use a well-ventilated fume cupboard, with a suitable arrangement for the air intake to pass over a hot-plate or other simple heating device. (If the atmosphere is too humid calcium chloride trays may be required to dry the air before drawing over the tubes.)

We have dried the concentrated plasma obtained both by the spray distillation process and by the cellophane tube process described above, using the lyophil technique developed by Flosdorf and Mudd (1935). The details of the method need not be described here, as they have been treated fully by Flosdorf and Mudd (1935), Knox (1939), and Greaves and Adair (1939). The size and design of the apparatus depend on the quantities to be dried. In one experiment 80 c.cm. of plasma concentrated from an original volume of 500 c.cm. by the cellophane tube method was divided between two flasks and frozen in a mixture of solid carbon dioxide and alcohol, the flasks being rotated to get an even film of solid round them. The two flasks were then attached to a condenser cooled in carbon dioxide and alcohol and evacuated, using a Cenco Hyvac pump. In thirty hours a completely dry light solid was obtained that was readily soluble in water.

The apparatus we used was one usually employed for the drying of small amounts of serum or bacterial suspensions, and the rate of drying of the concentrated plasma was undoubtedly lower than that of normal serum. The rate of drying of concentrated plasma would be expected to be less than that for solutions with a lower solid content; the presence of sodium citrate and sodium chloride is also an important factor. We have no doubt, however, that with suitable modifications of the simple apparatus we used the speed of drying can be accelerated.

Discussion

The plasma employed in the above experiments was obtained from blood collected in a citrate–saline mixture (430 c.cm. of blood to 70 c.cm. of 2.5% sodium citrate and 0.85% sodium chloride), the plasma being separated off from the blood under sterile conditions after two days' storage at 4° C. Normally, in order to delay the onset of haemolysis, glucose is added to the blood which is to be stored for whole-blood transfusions (Aylward *et al.*, 1940), but in these present investigations it was omitted since preliminary experiments had indicated that the presence of glucose retarded the drying process. Furthermore, if plasma is separated after two days the amount of haemolysis, even in the absence of glucose, is negligible.

The desirability of separating plasma as soon as possible, so that it will have the minimal potassium and phosphate contents, has already been stressed (Mainwaring *et al.*, 1940). This precaution is considered to be particularly necessary in view of the large amounts of plasma now recommended for use in each case (see Medical Research Council War Memorandum No. 1, 1940).

While the clinical effects of serum and plasma transfusions are probably similar (Magladery *et al.*, 1940) there are certain advantages in collecting serum rather than plasma. Serum will dry somewhat more easily than plasma owing to the absence of fibrin, sodium citrate, sodium chloride (and possibly glucose). Further, the absence of fibrin removes the danger of clot formation both before drying

and after reconstitution. On account of their relative simplicity and cheapness we hope that the methods described here will be of use in laboratories where expensive large-scale installations are not possible; so far as we can judge, the final dried products are similar to those obtained by the lyophil process.

Recent clinical reports on the use of concentrated plasma and serum are very promising (Medical Research Council War Memorandum No. 1, 1940), and the cellophane tube method should be of great help in the preparation of such concentrated plasma and serum, which can be prepared without risk of contamination and stored in any plasma bank. Many of the advantages claimed for dried plasma also apply to concentrated plasma. Moreover, concentrated plasma is prepared with considerably less risk of bacterial contamination and much more easily than is the dried form, and can be diluted to the required strength without the short delay necessary for the solution of plasma powder.

The methods we have described for the preparation of concentrated and dried plasma are capable of many modifications, according to the scale on which the processes are to be carried out, and in view of the importance of the matter at the present time we have thought it wise to put forward our preliminary results at this stage. A detailed clinical report on the use of dried and concentrated plasma will be published later.

Summary

Two methods for the concentration and drying of plasma have been described: (1) using spray distillation *in vacuo*; (2) using the principle of evaporation through cellophane tubes under sterile conditions, followed by low-temperature drying of the concentrate.

These methods enable large amounts of plasma to be concentrated and dried without undue cost.

Serum may also be concentrated or dried by these methods, and may prove more satisfactory than plasma.

This work has been carried out during the tenure of research grants from the Medical Research Council, to whom we wish to express our thanks, as well as to Dr. Brundret, department of bacteriology, University of Manchester, for enabling us to test out the final stage of the drying process in his laboratory. We acknowledge with thanks the supply of viscing casings from Messrs. John Crompton and Co., Wythenshawe, Manchester.

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F. G. Chandler, S. R. Gloyne, and D. V. Hubble (*Tubercle*, 1940, **21**, 292) record the case of a female infant, aged 12 weeks, who had difficulty in breathing since birth, and was admitted to hospital for increasingly frequent attacks of cyanosis. Death took place two days later. The necropsy showed that the right lung had several shallow grooves suggestive of imperfect accessory lobulation, and that the greater part of the lung was involved in a cystic condition with a disorderly arrangement of the bronchi. Histologically the cystic condition was due to an abnormal arrangement of air spaces and bronchi.

DYSMENORRHOEA AND STERILITY
PERSONALITY STUDIES

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Informed gynaecological opinions abound to the effect that personality factors are related to dysmenorrhoea and sterility in some way as yet undetermined, while some gynaecologists have gone further and suggest that psychological factors may actually be of primary importance in the production of both complaints. Conversely, many medical psychologists have noted that dysmenorrhoea and sterility are common constituents of various syndromes which are predominantly psychological, and that where psychological treatment is successful these gynaecological symptoms often disappear simultaneously with the others.

The patients to be described were submitted to a biographical study, occupying on an average two hours, covering the family background and, in rather more detail, the childhood characteristics, the reaction to various phases of adolescence, and the adult personality. Biographical studies of this type were made of 57 unselected patients with primary dysmenorrhoea, aged 16 to 40, 31 of them single; and of 30 patients with sterility of some years' duration, aged 21 to 45, similarly unselected. A suitable control group was found in 30 primigravidae, aged 19 to 40, who had never suffered from dysmenorrhoea; they were studied in an identical manner. Sedentary workers formed approximately half of each of the three groups. Complete verbatim reports were kept of each interview, and the data thus obtained from each group were later submitted to more detailed analysis and comparison (Table I).

TABLE I.—*Childhood Adjustment in Cases of Primary Dysmenorrhoea and of Sterility*

	Control (30 Cases)	Sterility (30 Cases)	Dysmenorrhoea (57 Cases)	
			Proportion (in 30 Cases)	Actual
Apparently well adjusted ..	19	9	5	9
Fairly well adjusted (e.g., concealed shyness)	8	7	7	13
Definitely ill adjusted : ..				
(*a*) Boisterous tomboy ..	2	3	11	21
(*b*) Resentful, aggressive ..				
(*c*) Miserable, non-aggressive	1	11	7	14
(*d*) Miserable, jiling				
(*e*) Exceptionally timid and shy				

Childhood Adjustment

It will be seen from the table that the control group of 30 normal primigravidae is mainly composed (27 out of 30) of women who give a history of having been as children well-adjusted or fairly well-adjusted types, familiar in the general population. The term "ill adjusted" was confined to children whose abnormality of emotional status was beyond discussion.

In the two groups who later complained of sterility and dysmenorrhoea there is a high proportion of ill-adjusted children as compared with the control group. Equally striking was the difference between the control group and the others in the degree of maladjustment of any particular type—for example, in the control group the

"well-adjusted" girls classed as boyish or vaguely masculine were represented in the "ill-adjusted" section of the dysmenorrhoea group as aggressive masculine children, ashamed and resentful of their femininity. The following are abbreviated examples of the grades of maladjustment mentioned.

Types of "Fairly Well-adjusted" Children

Concealed Shyness (later Sterile).—"I was a lively child and used to knock at doors and run off. I was rather mischievous and wanted everything my own way. I always wanted to be in everything. I was afraid of quarrelling with anybody; if another child took one of my toys I gave way. I didn't like to see anybody hurt in any way." "I mixed a good deal, mostly with girls. I was generally a leader; I was a bit 'bossy.' If I wasn't allowed to do a thing, I'd do it. Dolls appealed to me more than anything. I always wanted to get on, and dreamt of how I'd get on in the world." "I didn't go to many parties; at times I felt very uncomfortable when I went, and used to tremble. I was very nervous; if I went anywhere like that I used to get very excited. I never could get up and recite; if they asked me, I said 'No!' I used to blush and I was very sensitive; I couldn't go and speak to a stranger. If somebody spoke harshly to me I used to keep it bottled up until I had a free time. I didn't like being alone. I used to talk a lot in my sleep."

Types of Definitely Ill-adjusted Children

Boisterous Tomboy (later Dysmenorrhoea and Frigidity).—"I was very bright and full of beans, fidgety, and quick-tempered. If any mischief was on hand I used to be the leader. I was naughty, disobedient, and noisy—I was definitely a terror. I was always late at school, and used to fool around the class during lessons. I was called a tomboy, a scatter-brain, and a Bolshevik. If I didn't get my own way I got into terrible tempers, and would punch people, storm round the house, and bang the doors." "I imagined myself having exciting adventures and had an ambition to be on the stage and a great actress." "I was a brilliant scholar and a good organizer. I was always captain of the form and of the hockey team." Morbid fears were present.

Unsociable Child, with Long Periods of Vague Ill-health (later Dysmenorrhoea; Relative Frigidity).—"About a couple of months after mother's death I was playing in the street when my heart missed a beat, and then I had palpitations and collapsed; father took me to hospital. I got very depressed and was off school for two months. A little later I stayed in bed for a bit because I felt too ill to get up; I felt so weak I couldn't walk; I used to ride to and from school—about half a mile. They said it was weakness and nerves and there was nothing wrong. If I played games at school it was very apt to happen again: I collapsed. I wasn't allowed to do home-work." "I was a quiet child originally. I was very, very sensitive about anything cruel. If I was asked a question at school I'd blush and stumble. When I was walking down the street I used to think people were looking at me because there was something wrong with my clothes." "I was a very nervous child, and when I went down to the yard to the lavatory I used to have my sister with me. We always had a night-light in the bedroom. I used to have a lot of bilious attacks and vomiting; I would sometimes vomit twelve times in a day and then go along to the doctor." "I liked school and was a good scholar; got on well with everybody. I've always been very sympathetic, and they all tell me their troubles. I don't think I ever wanted a doll. Sometimes I'd say I wished I was a boy, but I was never really uneasy about it."

Childhood Adjustment in Relation to Adult Adjustment

Consideration of the patients who complained of sterility and dysmenorrhoea as adults shows clearly that in these groups the incidence and intensity of psychological maladjustment are to some extent the result of their disorders.

In biographical studies one may hope to separate in two ways the psychological symptoms arising before and after the onset of disease: first, by a comparison of the incidence in disease and control groups of maladjustment in early and adult life; secondly, by a developmental study, with a follow-up and comparison of the early and adult adjustment of each individual patient. When this was done there emerged strong evidence that in each group those who were maladjusted as adults had shown obvious signs of maladjustment as children. In the control group two of the three patients classed "ill adjusted as children" showed improved adjustment as adults as a result of favourable environmental conditions and opportunities. This sequence of events, however, was not at all obvious outside this group; and among the sterile and, in particular, the dysmenorrhoea patients the reverse process—a deterioration in emotional adjustment—was much more marked. These points are illustrated in Table II.

TABLE II.—*Adult Psychological Adjustment in Relation to Childhood Adjustment*

Control Group (30)		Sterility (30)		Dysmenorrhoea (57)	
As Children	As Adults	As Children	As Adults	As Children	As Adults
W W W W W W W W W W W W W W W W W W W	0 W W W W 1 W W W W W W W W W F F	W W W W W W W W W	0 Nil 1 W F	W W W W W W W W W	0 Nil 1 Nil
F F F F F F F	2 W W W W W W F F F F F F I I	F F F F F F F	2 W F F F I I I I I	F F F F F F F F F F F F F	2 W F F I I I I I I I I I I
I I I	3 W I 4 Nil	I I I I I I I I I I I I I I	3 W W W W W W F F F I I I I I I I 4 W I I	I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I	3 W W W W W W F F F F F F F F I I I I I I I I I I I I I I I I I I 4 W W F F F I I I I I I

Children are classed above as "Well adjusted" (W), "Fairly well adjusted" (F), and "Definitely ill adjusted" (I). Adults are classified in increasing degrees of maladjustment as 0, 1, 2, 3, 4. For comparison, Classes 0 and 1 are grouped as "well adjusted," 2 as "fairly well adjusted," and 3 and 4 as "definitely ill adjusted." In the "As Adults" columns "W," "F," and "I" give the childhood adjustment in each adult.

The matter is perhaps made clearer by the specific instance of a patient with dysmenorrhoea whose ill adjustment continued into adult life:

The youngest of the family, she was made a fuss of, especially by her father. "I used to admire my father's looks and his build. If I wanted anything I used to go to him. I never talked to mother; she wouldn't understand; and yet if she was ill I used to be the first to worry." The patient was not a strong child. Frequently, without apparent reason, she would "come over faint and lose consciousness for ten or fifteen minutes." When she came round she was sick. Travelling also made her sick. She was very quiet, timid, and shy. "I hadn't much life; I hadn't the power." She did not like playing with other children, but preferred to "keep myself to myself, and had big ideas about the future." At a party "I used to sit there and watch them." She always thought other children were better dressed, and blushed on the slightest occasion. "If anybody passed any remark I thought they meant me; I used to sit and brood." She could never stand up for herself; if anybody interfered with her

she would feel faint and get palpitation. "If somebody's eyes were looking at me I used to get terribly nervy." She was terrified of the dark, and fancied people were following her. Now, she says, "I am terribly nervous; I jump at everything—if the door slams. If anybody touches me from behind it startles me. I'm nervous of the dark and of being on my own. If I hear a noise I think it's someone in the room. I get quite frequent attacks of palpitation. Quite suddenly it comes on and lasts for twenty to thirty minutes. Sometimes I feel faint with it. For three or four years I've had terrible faint sweats. I get all hot and clammy and trembly. I get these fits once a week or fortnight, just walking along the street; excitement and worry bring them on. For two or three hours afterwards I have to sit down and take things easy."

Adult Sexuality

Omitting other aspects of the adult personality of these patients, there must now be described differences in sexual development of the primigravidae and of the patients with dysmenorrhoea and sterility.

1. *Preparation for Period.*—In relation to instruction before onset of the period no striking difference could be found in the three groups beyond slight excess of unprepared girls in the sterile and dysmenorrhoea groups.

2. *Reaction to Onset of Menstruation.*—The reaction of the patients to the onset of menstruation could be classified for the most part under the headings of Neutral, Anxious, Proud, and Resentful. Here are examples of each type:

Neutral (Control).—"When it happened I just took it for granted. I didn't think it anything terrible."

Anxious (Sterile).—"I was completely bewildered; I couldn't make out what it was or why, or anything about it."

Proud (Dysmenorrhoea Later).—"I was pleased because I must be well and healthy to have it."

Resentful (Periods at 12; Dysmenorrhoea at 15).—"It was a violent shock; I thought I had developed a severe illness. The periods became a sore point with me; I felt I was the only person to have them and was unfortunate. I thought it was just going to be an illness, but instead it became an unending misery to me."

Classifying the individual patients on the basis of the examples given, it will be seen that the ratio of girls who were neutral to those who resented menstruation varied in the three groups. The proportions were: control group—neutral 3, resentful 1; sterile group—neutral 1, resentful 1; dysmenorrhoea group—neutral 1, resentful 2. The obvious suggestion that the resentment of the dysmenorrhoea patients is the inevitable sequel of their pain does not really explain their attitude, since the resentment often preceded the pain. Further, girls with severe pain did not always express or feel resentment, and, perhaps more significant, there was striking evidence that the resentment was not directed so much towards the pain as towards the "messiness" and towards the actual period, which was regarded as an expression of feminine inferiority and an unfair handicap in relation to athletic and social activities.

3. *Premarital Attitude to Sexuality.*—In the control group the premarital attitude to "boy friends" showed two main types of equal frequency—girls who had several minor friendships before engagement and marriage, and girls who had not made any other than the most superficial contacts of this kind. In the sterile group the only significant difference was a relative preponderance of the second group mentioned above, a finding which corresponds with the excess of individuals in this group characterized by shyness and diffidence in social contacts. Among the dysmenorrhoea patients, in contrast to both the control and the sterile groups, there was an excess of girls who usually described themselves as "flirty." It could be seen from their elaboration of this description that this was very seldom the expression of an early adult interest in the opposite sex. Much more often it was the result of a wish for a continuation of the "spoiling" attitude of parents or, alternatively, resulted from the openly expressed motive of a spiteful desire to humiliate boys by the use of sexual attraction.

4. *Sexual Maturation as shown by Attitude and Behaviour in Coitus.*—It is an axiom of psychological work that the nature and maturity of adult sexual interests supply evidence about individual development which is less open to error than many other criteria. The findings so far reported point to the occurrence among the sterile group of patients of delayed and inhibited maturation in all aspects of adult life, while the dysmenorrhoea group are particularly characterized by individuals showing strongly resentful attitudes towards what is felt to be the inferiority of being feminine. As might be expected, these group differences are thrown into strong relief by an analysis and comparison of the adult sexual adjustment of the patients as shown by their behaviour in coitus. These reactions have been classified under five headings: normal orgasm, occasional orgasm, clitoris orgasm, complete absence of orgasm (with and without repugnance), and, lastly, fear of intercourse, dyspareunia, and vaginismus. In Table III the last three groups are included under the heading "Ill adjusted."

TABLE III.—*Sexual Adjustment in Coitus*

	Control (30 Cases)	Sterile (30 Cases)	Dysmenorrhoea (Total 26 Married)	
			Proportion	Actual
Well adjusted (normal orgasm) ..	22	4	7	6
Fairly well adjusted (occasional orgasm or clitoris orgasm) ..	5	11	7	6
Ill adjusted (no sexual feeling; no orgasm; dyspareunia; vaginismus)	3	15	16	14

It will be seen from the table that patients who are sexually mature, as shown by apparently normal orgasm, are distributed between "control" and "sterile" and "married dysmenorrhoea" groups in the proportion of 22:4:7. Conversely, gross abnormalities of sexual development, as shown by absence of orgasm, with or without repugnance to intercourse, are in the proportion of 3:15:16. Patients showing repugnance to or fear of intercourse, dyspareunia, or vaginismus in these three groups are in the proportion of 3:20:21.

Overlap between Dysmenorrhoea and Sterility.—Of 30 sterility patients 10 suffered from severe dysmenorrhoea; while of 26 married dysmenorrhoea patients 9 were sterile. Thus of the total of 87 patients in the two groups 19 suffered from both disorders, 13 of them of the basically shy and shut-in classes described as personality types in both disorders.

TABLE IV.— *Summary of Personality Types in Dysmenorrhoea and Sterility*

Dysmenorrhoea:		Sterility:	
Resentment of feminine role ..	15	Shy and immature	11
Allied types	11	Allied types	12
Shy and timid	15	Obese or maternal and middle-aged	5
Plaintive	14	Unclassified	2
Unclassified	2		

Personality Types in Dysmenorrhoea

In previous sections various aspects of the personality of these patients have been considered. Here follows an attempt to give tentative composite descriptions of various types seen in this disorder.

Resentment of the Feminine Role.—Members of this group form a common type whose psychological make-up

is obviously reflected in appearance, manner, and adult history. Hard and aggressive in expression, with unfeminine voices, masculine carriage, and a physical development in which female secondary sexual characteristics are less well marked than usual, these individuals frequently express their emotional outlook in their dress and behaviour. They give a history of having been, as children, over-attached to their fathers, uncertain or contradictory in relation to their mothers, and openly jealous of brothers. Their character at this time is most easily described as that of aggressive tomboys. Fond of rough games, disdaining dolls, and often outstanding at school, both in class and on the playing-field, they have frequently been captains of school teams and often monitors or prefects. From the onset of menstruation they have usually been openly resentful of it, less on the grounds of pain than of "messiness"—an attitude clearly seen in patients in whom the pain only started some years after the onset of menstruation. Although from the beginning they have usually tried to ignore the period by a special effort they have still felt with unusual keenness that it was an unfair handicap in the sports and allied activities which play such a prominent part in their lives. They are often attractive to and attracted by men on a basis of equal companionship; but their contempt of femininity becomes very obvious when any form of courtship is attempted: they are only anxious to be perpetual sisters to their men friends. In any more feminine field they display a hard emotional inaccessibility, which can often be seen to cover a rebellion against their own nature.

A further stage in the development of psychological attitudes of this kind can be seen in the determined spinsters who form a small subgroup of the patients just described. Other girls who are also basically of this type are handicapped in the presentation of a masculine attitude by the possession of obvious feminine good looks, which are, however, only used as a means of humiliating the admirers they so easily attract.

Shy and Timid, and Plaintive Groups.—The second typical group of patients with dysmenorrhoea have small juvenile faces, with a corresponding physique, sometimes to the point of fragility. Uniform in their physical immaturity, they yet show certain differences in the psychological field. One-half of them are timid, shy, and shut-in personalities, who had been as children typically over-attached to and spoilt by their parents. At this time their main psychological difference from other children lay in their constant self-consciousness about their appearance, and well- or ill-founded feelings of inferiority. They were jealous of the success of other children and often of boys in particular. Apparently resigned to the burden of menstruation and feminine duties, they could yet be seen to regard the onset of periods as a handicap which upset them by its affront to their high standards of fitness and personal cleanliness. They were even more disturbed by the significance of this event as marking the end of childhood. The second half of this group of patients, however, formed a variant of the first, identical except that their childhood had been occupied by serious or vague illnesses to such an extent that they had become something like plaintive invalids in their attitude to life. From early childhood onwards these individuals had been preoccupied with attempts to satisfy a deep craving for sympathy and affection. In the interests of this need they had overestimated their illnesses as children and naturally made use of their periods for a similar purpose. Small and pale-faced like the patients in the first part of this group, this second type are chronically anxious, and in their voices can be heard to complain continually.

Personality Types in Sterility

It has already been noted that the second group of dysmenorrhoea patients described overlaps with the main type found in sterility and now to be outlined. The vast majority of the sterile patients were diffident in manner, juvenile or younger than their years in appearance, and without marked secondary sexual characteristics. They were often more ambitiously dressed than others of their class, or so differently, especially in relation to the use of make-up, that their total appearance could best be described as "doll-like."

Individuals of this type had frequently been the youngest or only children, obviously over-attached to the family rather than to either parent. Intensely shy, especially with grown-ups, they disliked school because of the roughness of other children and preferred to stay at home, even in adolescence, when their shyness prevented many outside contacts. At this time they seldom expressed any feeling about menstruation, since they found the topic too embarrassing. Many of them as adults are interested to an unusual degree in their personal appearance and obviously desire to attract; but neither before nor after marriage have they ever experienced any genuine adult sexual feeling. In fact, they are almost completely frigid and, corresponding to this, incapable of any deep affection.

Allied types with most of these characteristics may show superficial differences in vaguely boyish features or be so nervous as to justify the label "anxiety state." A small subgroup of patients complaining of sterility are obese women, with strongly marked maternal attitudes although they have never reached adult maturity in their instinctual development. Their obesity was not related to their sterility in any mechanical way. Lastly, in a few parous patients subsequent sterility had been preceded, as they themselves pointed out, by a diminution or disappearance of sexual feeling.

Discussion and Conclusions

Dysmenorrhoea.—Obstruction, maldevelopment, endocrine dysfunction, and localized autonomic disturbance have all been held responsible for dysmenorrhoea (Ehrenfest, 1937; Davis, 1938). The view that neurotic manifestations associated with dysmenorrhoea are mainly secondary in nature is held by Shaw (1938) and Miller (1933). It is a common observation that dysmenorrhoea is predominantly a disease of the better-educated and cultured classes, is aggravated by mental or physical strain, and is relieved during holidays (White, Berkeley, and Cook, 1938); and that the onset of dysmenorrhoea is frequently preceded by some emotional disturbance, often, but not necessarily, sexual (Meyer, 1925; Naber, 1931). Some authors suggest that dysmenorrhoea is frequently allied to temperaments described as "nervous, apprehensive, and introspective" (Fairbairn, 1928; Johnstone, 1939; Kerr *et al.*, 1939; Novak and Harnik, 1929). Psycho-analytical aspects of gynaecology have been discussed by Abraham (1925), Horney (1933), Menninger (1939), and Rickman (1926). The present study strongly suggests that dysmenorrhoea predominantly occurs in individuals with certain psychological characteristics which antedated the onset of their complaint. In the most general terms patients with dysmenorrhoea, as children, had often been either unusually aggressive and boisterous tomboys resenting their feminine role, or ailing complaining children, unwilling or unable to give up their childish dependence on their parents and possessing strong needs or cravings for sympathy and protection.

These superficial studies do not completely answer questions as to the possible groups of psycho-physiological

mechanisms by which the symptom of dysmenorrhoea may be produced. Psychological attitudes and allied emotional states may lead to increased interest and awareness of physiological uterine functions or to an autonomic endocrine disturbance affecting uterine function, or to both. In the second case, as elsewhere, the pain might easily arise from relative ischaemia through disturbance of the relation between the reciprocally innervated muscular contraction of body and cervix and the vasomotor state of the organ.

Sterility.—In the sterility patients production of active spermatozoa by the husbands was known to have occurred. Similarly, in these patients organic disease affecting the general health, and relevant pelvic conditions such as blocked tubes, have been excluded by careful examination by our gynaecological colleagues. Our investigation showed that, as in the case of dysmenorrhoea, patients who later complained of sterility were even as children different from the control group of primigravidae of the same age. The well-known clinical overlap between primary dysmenorrhoea and sterility is reflected in the presence of a common personality type in both groups described. The main group of sterile patients, however, are not of this particular type, either as children or as adults, but display as a main characteristic a self-centredness and lack of warmth in their social and personal relations, clearly seen in a sexual frigidity of which their abnormal reaction to coitus forms an impressive index. As to the mechanism by which the personality of the patients is related to their sterility, experience shows that sterility is unlikely to be the direct result of infrequent intercourse. Many gynaecological authors, both ancient and modern, have suggested that the mental attitude of the woman (Aristotle), inhibition of orgasm by unrecognized anxiety, or lack of orgasm through emotional immaturity may interfere with conception by preventing the progress of spermatozoa (Duncan, 1884; Rubin, 1933; Fairbairn, 1928; Anspach, 1934; Gellhorn, 1931). This might result from dryness of the vagina, from failure or reversal of possible vaginal peristaltic movements, or through spasm of the muscles of the pelvic floor and the cervix, with failure to retain the seminal fluid. It has further been suggested by gynaecologists that emotional development and frame of mind may affect the endocrine processes controlling ovulation and implantation (Kehrer, 1922). To the solution of these problems hormonal research may furnish new clues.

Summary

Fifty-seven unselected patients with primary dysmenorrhoea, 30 unselected patients complaining of sterility, and 30 primigravidae who had never suffered from dysmenorrhoea were submitted to a biographical study covering childhood characteristics, reaction to adolescence, and adult personality.

Comparing the three groups as children, psychologically well-adjusted types were found in great excess in the control group, and only two of this type were noted in the sterility and dysmenorrhoea patients.

As children the dysmenorrhoea group showed psychological maladjustment four times as often as the control group. Of these maladjusted types the sterile group contained a high excess of ailing, timid, unsociable children, devoid of self-assertion, while the dysmenorrhoea group contained an excess of children who were boisterous and manifestly aggressive—obstinate, bad-tempered, or headstrong.

As adults the dysmenorrhoea patients showed a high excess of two main personality groups—the first characterized by deep resentment of their feminine role; the second obviously immature physically, and either shy and shut in or chronically anxious and complaining. As adults a vast majority of the sterile patients display an unusual self-centredness in their social and personal relations, clearly seen in a sexual frigidity, with abnormal reactions to coitus.

Prof. Browne and his staff at University College Hospital and the Medical Committee and staff at the Soho Hospital for Women were good enough to arrange access to these patients and to the clinical notes. We are greatly indebted to them. The work was done during the tenure of Fellowships endowed by the Sir Halley Stewart Trust and the Rockefeller Foundation.

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TRAUMATIC CHYLOTHORAX

BY

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AND

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Rupture of the thoracic duct is a calamity which many a surgeon does not encounter once in his lifetime. Since Longelot first described the condition in 1663, Shackelford and Fisher (1938) have succeeded in tracing only 41 authentic instances, and many years have elapsed since chylothorax was last mentioned in the *British Medical Journal*.

Although our experience is limited to a single unsuccessful case we are led by the rarity of the injury to describe this patient's history as fully as possible.

Case History

On August 16, 1940, a collier aged 32 years ate a large breakfast of bacon and eggs at 6 a.m. He was working underground at 9.30 when he was thrown backwards by a stone which struck him in front of the chest. As he fell his dorsal spine was brought into violent contact with the square-cut edge of a block of coal. He experienced an immediate feeling of constriction in the chest and acute pain in the left knee-joint, but a moment or two afterwards was able to crawl away.

When Dr. R. M. Marshall examined him two hours later there was no dyspnoea and the degree of shock was trivial. The patient was most concerned about "a gripping tightness" in the right chest, and this was thought to result from a linear abrasion which traversed the back horizontally at the level of the tenth dorsal vertebra. Radiographs which were made at Port Talbot Hospital on the following day disclosed a fissured fracture of the left tibia and possible damage to the body of the ninth thoracic vertebra with no displacement. The ribs had all escaped injury, and there was no evidence of a pleural effusion.

On August 18 the temperature rose to 100° F., and for the first time there was some dyspnoea. A tentative diagnosis of pneumonia led to the administration of sulphapyridine tablets. On August 19 the patient collapsed; his pulse rate was 130 per minute, his temperature was subnormal, and his respirations were rapid and distressed. We decided to aspirate a moderate-sized right-sided pleural effusion, and to our surprise a quantity of fluid which resembled pale tomato soup

was withdrawn. The pathologist's report indicated that we were dealing with a case of chylothorax.

The initial aspiration produced a temporary improvement, and energetic steps were then taken to restrict the intake of fats and to rely on rectal feeding. It was impossible to control the outflow of chyle, however, and on August 21, against our better judgment, we again felt obliged to aspirate. On this occasion five pints of similar fluid were removed and relief proved dramatic. Although obviously wasted, he became cheerful and was quite free from pain. Continuous intravenous glucose–saline was now administered, but again and again chyle accumulated, and in all twenty-seven pints had been aspirated by August 27, when the patient died in a state of exhaustion. Dr. A. F. Sladden, who undertook a post-mortem examination, has been kind enough to furnish the following notes:

"During life a sample of fluid aspirated from the right pleural cavity was examined and found to be sterile and free from excess of leucocytic cells, but milky in consistency and appearance. Further analysis showed the presence of fat to the extent of 0.83%, and the effusion was accordingly regarded as chylous in nature. At the post-mortem examination the right lung was found collapsed, with some chylous effusion around it. No effusion was present on the left side. The parietal pleura as it lay along the spinal column was torn to form a diamond-shaped gap 3 inches long and 3/4 inch wide, the greater length of the 'diamond' being in the line of the spine on its right lateral aspect. The centre of this lesion lay across the level of the ninth and tenth thoracic vertebrae, and the junction of these two vertebral bodies was completely fractured though there was no displacement. The anterior ligaments had been completely torn across, and this injury had also severed the thoracic duct as it passed upwards along the spine. From this torn duct chyle had leaked into the right pleural cavity and had caused profuse effusion of fluid around the right lung."

Discussion

McNab and Scarlett (1932) in an authoritative article on traumatic chylothorax mention that rupture of the thoracic duct most frequently causes an effusion into the right pleural cavity. They suggest that this occurs because the duct is on the right side for two-thirds of its thoracic course, the aorta forming a barrier to the left. In the experience of these clinicians there is seldom a history of crushing violence, and, excluding penetrating wounds, trauma is usually due to a sudden and exaggerated lordosis of the spine, causing excessive stretching of the duct. They hold that rupture is more likely to occur shortly after the ingestion of a large meal, when the duct is distended by chyle. Usually a silent post-accident period of three or four days is followed by the abrupt onset of dyspnoea, rapid thready pulse, pallor, cold sweats, and profound shock. The injury has proved fatal in 50% of the recorded instances.

Clearly the case we have described does not in any way upset the general conclusions of McNab and Scarlett, but it may provide a means of accounting for the "latent period," which is so mystifying. It is quite conceivable that after rupture of the thoracic duct the chyle, which is not under any marked pressure, first accumulates behind the fairly resistant pleura. When a portion of the latter membrane becomes tense enough for its blood supply to be depleted erosion would be simplified and subsequent outpouring of chyle would precipitate symptoms of intense shock. Our only evidence in support of this theory is the diamond-shaped pleural tear described by Dr. Sladden, which might have resulted as readily from erosion as from trauma.

Treatment

The methods of treatment which have been recommended in traumatic chylothorax are varied and in some instances contradictory. They include: (1) abundant administration of fluids by mouth; (2) curtailment of fluids and the institution of rectal feeding; (3) a fat-free diet; (4) a diet rich in fats (one practitioner actually administered chyle by mouth!); (5) whole-blood transfusions and continuous intravenous glucose–saline (since treating our case we have learned that glucose causes a rise in lymph pressure, so that in all probability this measure is harmful); (6) the creation of a positive intrathoracic pressure by means of artificial pneumothorax—apparently this cannot possibly compress the ducts enough to prevent the outflow of chyle; (7) thoracotomy, with removal of large clots—the aim of this more heroic measure appears to be the production of adhesions around the leaking duct; (8) reintroduction of extravasated chyle.

The last-mentioned treatment strongly appeals to us, and we regret our ignorance of the technique when our case was under observation. Bauersfeld (1937) describes a patient suffering from chylothorax whose condition steadily retrogressed until tubing from a needle in the chest was connected with a direct transfusion set and the fluid was reintroduced into the right median basilic vein. The general condition then steadily improved and weight increased rapidly. It may be, as Bauersfeld modestly suggests, that sealing of the tear in the duct occurred in the period during which intravenous chyle was administered; but even if this be so it does not detract from the value of his novel treatment.

Unduly impressed, perhaps, by our recent experience, we feel bound to advise that even in trivial injuries to the neck, chest, and spine the possibility of damage to the thoracic duct must always be envisaged. Moreover, in these days of falling masonry and of stabbing and bullet wounds it is not unlikely that chylothorax may be met with more frequently than in the past.

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COMMON BILE DUCT OBSTRUCTION

IMPORTANCE OF SURGICAL DECOMPRESSION

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In spite of the growth of hepato-biliary surgery the patient with jaundice as a result of common bile duct obstruction still represents a complex surgical problem. Many investigations of this pathological state are being carried out to-day, and it is only by examining the physiological, clinical, and surgical aspects of the question that new advances can be made.

In the past decade the importance of the mechanical alterations in the biliary system has come to be recognized. This is of value because not infrequently they are the sole cause of the severe damage to the liver and are also often associated with other inflammatory conditions. It is necessary to study these mechanical alterations in the biliary system in two sets of circumstances: (1) during the obstruction of the common bile duct; and (2) during the decompression of the biliary tree.

Effects of Obstruction of the Common Bile Duct

In reference to the former, the most important consideration is the phenomenon of biliary hypertension. It is well known that the bile pressure increases progressively after obstruction of the common bile duct, and this increase in pressure is responsible for the dilatation of the intrahepatic and extrahepatic bile channels. This

hypertension, occurring in a viscus in which further distension is limited by its capsule, has repercussions on the more delicate elements of the parenchyma—the liver cells and the blood vessels. Following upon this we see:

(*a*) *The Mechanical Effect on the Epithelial Cells.*—In the lobules the dilated bile capillary causes compression and disruption of the columnar cells. The intercellular fissures allow the escape of bile into the blood capillaries and lymphatic spaces, and thus bring about jaundice.

(*b*) *The Effect of this Biliary Hypertension on the Blood Circulation.*—Interference with portal circulation is brought about through compression of the interlobular veins by the distended bile ducts. Often the sinusoids also are compressed by the dilated bile capillaries.

The extension and intensification of these two groups of alterations are proportionate to the duration and the degree of common bile duct obstruction.

The above facts have been observed by different workers and also by me in experimental animals (thirty-two dogs) and in man. These histological changes are of clinical importance because they show that a patient with biliary obstruction suffers a progressive loss of the vital activity of the liver, and therefore the risk becomes increased with imprudent waiting before draining the biliary tracts. The importance of this is apparent when it is realized that cellular regeneration is markedly inhibited while the obstruction is present (Bollman and Mann, 1936).

Decompression of the Biliary System

More recently the second aspect of the problem—the decompression of the biliary system—has been the chief object of consideration. It is on this question that I wish to lay particular stress.

A general pathological principle to consider first is that *the delicate elements of an organ exposed for some time to an increased internal pressure do not reassert themselves in the same manner when the decompression is carried out suddenly as when it is carried out gradually.* In connexion with this principle, what are the physiological and pathological modifications in the liver during biliary decompression? There are three factors to be considered in relation to this: (1) the rate of the decompression; (2) the degree of the obstruction; and (3) the duration of the obstruction.

Regarding the first of these factors it is recognized that rapid drainage of the bile brings about an important alteration in structure of the hepatic lobule, whereas slow drainage does not cause as substantial a change in the parenchyma of the liver. I carried out a series of experiments the object of which was to study this question (Canonico, 1938). In fifteen dogs I produced a mechanical obstruction of the common bile duct. After a period of obstruction varying from one to fifteen days the biliary system was decompressed by removal of the ligature (slow decompression), by indirect cholecystostomy (rapid decompression), and by two-stage cholecystostomy (rapid and slow decompression). The histological changes were as follows: In the case of rapid decompression destruction of the normal lobular architecture occurred; the blood capillaries immediately became congested, resulting in many cases in rupture of the walls, with ensuing haemorrhage. The columnar cells were disrupted and the cells underwent necrosis and autolysis. These changes were more intensive the longer the duration and the greater the degree of the obstruction. On the contrary, with slow experimental decompression there was no marked change in the lobular structure.

What is the pathogenesis of the observed phenomena resulting from sudden decompression? I believe these are a result of the physical changes in the parenchyma. As previously established the biliary hypertension during the obstructive period is responsible for the collapse of the sinusoids and the interlobular branches of the portal vein, with the ensuing interference with the blood circulation. In these circumstances if an extensive bile drainage is performed a sudden fall in pressure is produced in the bile system with a corresponding sudden increase in the vascular system. Consequent upon this rapid increase of pressure in the blood vessels there is possible rupture of the capillary walls (haemorrhage *ex vacuo*) and intensive disruption of the columnar cells. On the other hand, the gradual lowering of the bile pressure allows the progressive re-establishment of the balance between the biliary and the circulatory systems without substantial damage to the lobular structure.

In accordance with the above concept it is quite simple to appreciate the importance of the second and third factors. The greater the duration and the degree of obstruction of the common bile duct the more favourable are the conditions for the production of the pathological changes, for the cellular lesions and the circulatory interference are increased. In the experimentally produced total obstructions lasting only twenty-four to forty-eight hours, or in the partial obstructions, sudden decompression resulted in less damage. In other words, these facts are in keeping with the known phenomena of rapid decompression in any hollow viscus, as seen particularly in rapid emptying of a markedly distended bladder with the resulting congestion and haemorrhage into the mucous membrane. McLaughlin and Levering have obtained similar results in their studies of rapid lowering of gastric pressure.

I feel that these findings are of practical importance in the surgery of obstruction of the common bile duct, and believe that the same phenomena observed in the experimental animals occur in the human and are responsible in some cases for two post-operative complications—haemorrhage and "hepatic insufficiency."

Commentary

From the above follow two principal conclusions: first, aspiration must be avoided in any bile drainage; secondly, gradual decompression of the obstructed biliary system must always be the procedure of choice.

To obtain slow decompression one should not use a large-bore drainage tube. It is also essential to regulate the flow of the bile so that emptying occurs very slowly. To procure this it is sufficient to compress the drainage tube partially with the ordinary clamp or to raise the tube to a level above the bile duct that will neutralize the biliary pressure. Ravdin and Frazier use for this a simple apparatus. In general, during the first twenty-four hours there should not be collected more than 250 to 300 c.cm. of bile. After this the rate of drainage is regulated to increase the flow of bile. Our experience with slow decompression in man is very heartening. Among British surgeons Sir John Fraser (1938) suggests: "When operating on cases which are profoundly jaundiced adopt a two-stage method, for by this means the risks of a sudden biliary decompression are diminished."

In conclusion may I repeat that "hepato-biliary surgery bases its progress on the increased knowledge of the physiopathology of the liver and its excretory ducts" (Canonico, 1937).

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BILATERAL OEDEMA OF LEGS AND ANKLES FOLLOWING FIXATION OF CHEST FOR FRACTURED RIBS

REPORT ON TWO CASES

BY

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AND

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The following two cases appear to be of rather unusual interest in that oedema of the feet and legs developed after fixation of the chest wall for fractured ribs.

The patient, a man aged 63, was referred from the orthopaedic clinic with a history of having slipped in his home and hit the corner of a table with his chest. He came to hospital the same day complaining of tenderness over the anterior end of the right and the left third rib, with pain on deep inspiration. Fracture of both third ribs was diagnosed and confirmed by radiograph, the fractures being one and a half inches from the anterior end. Adhesive strapping was applied to the whole circumference of the chest. The patient attended regularly for observation. Three weeks later he complained of swelling of both ankles. At this stage he was referred to us with the history and complaint already stated. His previous medical history was entirely negative. The patient was of good physique, somewhat pale, but not anaemic or dyspnoeic. He was strapped round the whole circumference of the chest, from the third rib downwards, by four pieces of strapping which overlapped each other.

On examination he was seen to have oedema of both legs and feet with marked pitting on pressure. He had no varicose veins. The temperature was normal, the pulse rate 72, and the blood pressure 120/80. The urine was acid, with no albumin or sugar. The heart revealed a maximal impulse in the fifth space half an inch within the nipple line and well localized. No murmurs were heard and no enlargement of the heart was detected. The chest was completely clear, and without crepitations at the base. There were no signs of free fluid in the abdomen, and no enlargement of the spleen, liver, or of the glands anywhere. The central nervous system was normal.

The strapping was removed, and a week later the patient attended again at the medical out-patient clinic. He reported that the swelling had disappeared two days after removal of the strapping. On examination the oedema of the legs and ankles had completely gone, and had not reappeared when the patient was seen again two weeks later.

We are prompted to report the above case by the fact that five months ago we had an exactly similar one.

A man aged 50 was strapped for fractured ribs. After wearing his strapping for a month he was referred from the orthopaedic department with oedema of the legs. The findings again, apart from the oedema, were completely negative: normal pulse rate, normal blood pressure, no abnormal cardiac signs, no previous history of swelling anywhere, no abnormal cardiac or renal history, no varicose veins, no enlarged glands, no albuminuria.

In this earlier case the oedema also disappeared forty-eight hours after removal of the strapping. The patient attended again after a week and after a fortnight, and the oedema had not recurred.

Discussion

It is difficult to correlate these two cases with any of the usual causes of oedema. In the first place there was no previous history of cardiovascular or renal disease or of angioneurosis, and no clinical signs pointing to any of these diseases, except the oedema; secondly, the oedema was a true oedema; thirdly, the patient was ambulatory the whole time; and, lastly, the oedema disappeared dramatically after removal of the strapping in both cases, with no recurrence.

Many of the diseases outlined by French (*Index of Differential Diagnosis*) are examples of intrathoracic diseases, whose production of oedema is not surprising. Is it possible that an extrathoracic cause like strapping can also give rise to the same phenomenon?

It is interesting to recall that Samson Wright in his *Applied Physiology* (1937), discussing the venous return, states (page 353):

> "With each inspiration there is an increased negative pressure in the pleural cavity which aspirates blood towards the heart." (Cf. page 430 quoted below.) "The diaphragm descends, raises the intra-abdominal pressure, and so squeezes blood out of the splanchnic veins."

On page 430, discussing intrapleural pressure, he says:

> "The intrapleural space is very small in the living adult, as the visceral and parietal layers of the pleura are practically in contact. The pressure in the pleural cavity is subatmospheric, and is −5 mm. Hg (that is, 5 mm. less than atmospheric) during expiration and −10 mm. Hg during inspiration. The pressure in the lungs is about one atmosphere, as they are in free communication with the outside air. The full intrapulmonary pressure is not transmitted to the pleural cavity, however, owing to the elastic recoil of the lungs. The more the lungs are stretched the greater is their tendency to recoil. *Consequently the more the lungs are distended by a deep inspiration the more subatmospheric (that is, more negative) does the pressure in the pleural cavity become.*"
>
> "As previously pointed out" (continues Samson Wright—page 353, quoted above), "the negative intrapleural pressure aids the venous return to the chest. If the chest wall is widely opened air enters the pleural cavity and the lungs collapse."

Can it be possible that a condition such as strapping, which prevents deep inspiration or, shall we say, makes deep inspiration more difficult than usual, after a time causes embarrassment of the venous return?

This condition seems to be very unusual, since a careful search of the literature up to date has revealed no reference to it.

Summary

Two cases of bilateral oedema of the legs and ankles are reported following strapping of the chest wall, and disappearing after removal of the strapping.

Can fixation of the chest wall, by interfering with deep inspiration, ultimately result in embarrassment of venous return?

Our thanks are due to Mr. E. S. Brentnall, honorary orthopaedic surgeon, Ancoats Hospital, for referring these cases and for allowing us to make use of his records.

R. M. Buchanan (*J. Hyg.*, 1940, **40**, 605) records his observations on fifty cases of cerebrospinal meningitis in the Sudan, which, he says, does not differ from the disease as observed in more temperate climates. It presents no racial peculiarity in response to infection or to chemotherapy. There is no sex or age peculiarity in incidence, both sexes and all ages responding to chemotherapy. Buchanan has found that sulphapyridine is superior to sulphanilamide in the shortening of invalidism and prevention of complications. In most cases oral administration is as effective as intramuscular. The initial dose is 2.5 grammes for adults and 1 to 1.5 grammes for children, with subsequent graduation of treatment. The course need not be prolonged beyond seven days.

Clinical Memoranda

Strangulated Inguinal Hernia in a Child of 5 Weeks

Strangulated inguinal hernia is one of the more common surgical emergencies, but it is in babies that strangulation of a congenital hernia is very rare, and it is for that reason that I should like to record the following case.

CASE REPORT

Terrance, aged 5 weeks, was the third child of a normal mother aged 26, the first child being stillborn and the second a healthy girl. He was a breech delivery, and the mother said that a foot was delivered first; but it does not seem to have been a case of prolapsed leg, as an anaesthetic was not given.

The patient and his mother were admitted to Guy's Hospital under Mr. Bromley at noon on August 21. He had had no previous illnesses, but at birth his mother had noticed a lump in his right groin which disappeared after a week. At 5 p.m. on the day before admission the child began to scream, and the mother decided to feed it; she found it would not drink—it had always been breast-fed—and she noticed that the lump which had been present at birth had reappeared. She took the child to her doctor, who gave it some sedative mixture, and it was then quiet until 3 a.m. the following day, when it began to get more pain, in which it drew up the right leg and vomited. The bowels had not been opened since 2 o'clock the previous afternoon, but there had been no trouble with micturition.

On admission the child was very shocked, but did not look wasted or dehydrated; it was getting attacks of colic in which both legs were drawn up, and it was screaming continuously. It was vomiting bile-stained matter. On examination there was a lump in the right inguinal region which was red, tender, tense, irreducible, and which gave no impulse when the child cried; the right testis was absent. The abdomen was distended with visible coils of gut, but there was no visible peristalsis; it was resonant to percussion, and on auscultation increased intestinal sounds were heard. There were no faeces in the rectum.

A diagnosis of strangulated inguinal hernia was made, although in view of the rarity of the condition at that age, and the fact that the right testis was not present, a torsion of the testis was considered.

At operation, under a local anaesthetic (0.5% procaine), the inguinal canal was opened and the absence of the testis confirmed. A very tense hernial sac was found; this was opened and was seen to contain about eight inches of blue ileum, one inch of which was plum-coloured and showed petechial haemorrhages on its surface. At first mesenteric pulsation was not palpable, but after wrapping the gut in hot towels for about ten minutes a weak pulsation returned. A tough constriction at the internal inguinal ring was divided, but at that stage of the operation the child began to cry and a general anaesthetic of ethyl chloride and ether was given to enable the intestines to be returned to the peritoneal cavity. No gut resection was attempted, as this procedure in infants has a mortality rate of 100%, and no repair operation was performed to strengthen the inguinal canal.

The child was given 20 oz. of saline by a subcutaneous drip during the first twelve hours following the operation, and then had a breast-feed. As it did not vomit, these feeds were repeated three-hourly, and eighteen hours after the operation the child passed a motion with some altered blood.

The patient continued to feed normally, began to pass the motions as it always had done, and was discharged fit after six days. The wound had become infected owing to its site in the groin, but it was felt that the child would be less likely to run the risk of an intercurrent infection if nursed at home.

My thanks are due to Mr. Bromley for allowing me to publish the details of this case.

Guy's Hospital, London. JOHN GORDON, L.R.C.P., M.R.C.S.

Reviews

DISEASES OF THE BILIARY TRACT

Diagnosis and Management of Diseases of the Biliary Tract. By R. Franklin Carter, B.S., M.D., F.A.C.S., Carl H. Greene, Ph.B., M.D., F.A.C.P., and John Russell Twiss, M.D., F.A.C.P. (Pp. 432; 84 figures; 6 plates. 32s. 6d.) London: Baillière, Tindall and Cox. 1939.

In a volume of 400 pages the authors have collected and analysed the experience and results of the past ten years of management of a separate clinic in New York for the study of diseases of the biliary tract. Their purpose in the book is to present modern concepts of the basic factors in gall-bladder disease and to describe the methods of investigation which will enable a decision to be made whether surgical or medical treatment should be carried out in the individual case. Chapters on the physiology of the biliary tract, enlargement of the gall-bladder, pain of biliary colic, gall-stones, and jaundice are followed by the approved methods of investigating hepatic function. The technique of duodenal drainage and details of the examination of the fluids obtained, both chemical and bacteriological, are clearly described, with special chapters on the relation of the colon and typhoid bacilli to gall-bladder disease. The authors incline to the metabolic cause of gall-stones, finding that infection follows and does not precede their formation. Hence efforts by medical means to eliminate from the biliary tract the results of infecting organisms are disappointing, but the tendency to reduce the number of operations in chronic cholecystitis without stones is increasing rapidly.

"Generally speaking, the most satisfactory results have been obtained by cholecystectomy in the treatment of typhoid carriers, the obliterated or encysted gall-bladder, in chronic cholecystitis with cholelithiasis, and in obstruction of the common duct. In the absence of stones, any gall-bladder capable of concentrating and emptying bile is considered in the clinic to be worthy of a thorough trial period of medical treatment."

The medical management consists of (1) a diet low in fats, cholesterol, and roughage, with abundant carbohydrates and fluids; (2) medicaments of various sorts—olive oil to stimulate contraction of the gall-bladder, bile salts to stimulate the secretion of bile by the liver—and measures directed to the relief of intestinal stasis such as the sulphates of alkalis and alkaline earths—the basis of the renown of many spas for the treatment of liver trouble; (3) vaccines from bile or any suspicious location of focal infection such as nose, throat, teeth, tonsils, sinuses, pelvic organs, or stools. The doses recommended are of 20 to 50 millions twice a week, very slowly increasing the amount. Systemic reactions are assiduously avoided, and the vaccine treatment is continued for at least three or four months. Special measures are adopted for hypotonic gall-bladder with hypochlorhydria and for hypertonic gall-bladder with gastric hyperacidity. A number of diets with low cholesterol and low fat content are quoted, and alternatively "stimulating" diets with high fats. As direct antiseptics for the gall-bladder contents there is some evidence of the efficacy of the sulphonamides.

Unless clinical improvement results from medical treatment within six to eight weeks, the original diagnosis must be reviewed or a change in medical treatment made. The patients are no longer referred for cholecystectomy unless there are clear indications for surgery. Dyskinesia is to be differentiated from non-calculous cholecystitis. Cholelithiasis is a greater indication for operation. The authors discuss in full the results obtained in various groups of

patients with chronic symptoms from the gall-bladder or reflexly from other diseased abdominal organs. A different picture and more exacting indications for early operation are found in acute cholecystitis.

This most instructive book will be used for guidance and reference by all who are working on the interesting problems involved in the study of gall-bladder disease. The recent literature is referred to at the end of each subject discussed.

ARTIFICIAL PNEUMOTHORAX

Artificial Pneumothorax. Its Practical Application in the Treatment of Pulmonary Tuberculosis. Contributions by Saranac Lake Physicians to the Studies of the Trudeau Foundation. Edited by E. N. Packard, M.D., J. N. Hayes, M.D., and S. F. Blanchet, M.D. (Pp. 300; 85 figures. 21s. net.) London: Henry Kimpton. 1940.

The name of the Trudeau Foundation at Saranac Lake, N.Y., should need no introduction to anyone connected with tuberculosis work. In this volume the high standard of previous studies published from the same source is fully maintained. The book will attract and deserve wide attention because it provides a full (yet succinct), well balanced, and very readable account of all the features of pneumothorax therapy. The account is up to date, and is particularly valuable because, as E. R. Baldwin points out in the foreword, it is not a compilation of the literature but presents largely the results of the individual experience of the contributors. Yet these results are presented with complete absence of dogmatism and in a spirit that invites the reader's intellectual co-operation. A consequence of this is, however, that the volume is more suitable for those who have already had experience of the treatment of phthisis than for the novice, who must still learn about artificial pneumothorax at the bedside under the guidance of an experienced hand. It is a great tribute to the editors that in spite of the number of contributors—as many as sixteen—there is but little overlapping in subject-matter and few differences of opinion; and even uniformity in style has been achieved. An excellent summary and remarkably well chosen and adequate references are given at the end of each section.

More detailed analysis of the book reveals differences in the quality of the various sections, though judgment on this must depend to some extent on the views held by each reader. Thus the reviewer would like to single out as particularly sensible and helpful the sections on the technique of operation by F. B. Trudeau, on accidents during operation by E. N. Packard, on pleural complications by J. N. Hayes, and on duration and termination of treatment by J. W. Price. On the other hand, the chapter on the physiology of artificial pneumothorax is disappointing, and that on selection of cases confusing; at all events the author has not been able to convey his views to the reader clearly. In the chapter on the value of radiography artificial pneumothorax (throughout "the *x*-ray" is used as synonymous with "radiograph" or "skiagram") we still find lesions classified as exudative, proliferative, or productive and fibroid, and the following statement, which must be challenged: "The roentgenologist's experience in following by the films the course of hundreds or thousands of tuberculous patients will enable him to determine with a fair degree of accuracy the activity of the lesion from a single set of *x*-ray films." The views expressed in regard to positive pressures in the section on conduct of treatment are particularly open to criticism. It is not to be denied that at certain stages of the treatment and under special conditions positive pressures may be justified when applied by the very experienced. But this is a far cry from stating that artificial pneumothorax may be spoken of as of two kinds: (*a*) collapse or relaxation pneumothorax, and (*b*) compression pneumothorax, and suggesting that positive pressures may be used to stretch adhesions, however "cautiously." Fortunately the chapter on thoracic surgery in relation to artificial pneumothorax acts as a healthy corrective to this view.

Many interesting and instructive follow-up results are given in different sections of the book. The illustrations are adequate, and there is an illustrated chapter on the pathology of the tuberculous lung treated by artificial pneumothorax. This book should be widely read. It provides an excellent frame on which to weave the pattern of one's own experience in this form of therapy.

FIRST AID

First Aid Manual. By M. Naughten, M.D., D.P.H., and J. P. Shanley, M.D., D.P.H., B.Sc. Irish Red Cross Society. (Pp. 171. 2s.) Dublin: The Richview Press.

First Aid for War Casualties occurring at Home from Air Raids and Other Forms of Attack. By Norman Hammer, B.Sc., M.R.C.S., L.R.C.P. (Pp. 71. 1s. 6d. net.) London: Dale, Reynolds and Co., Ltd.

The ideal manual of first aid should be concise, written in simple language, and well illustrated. It is important to train the learner to consider the patient first and his injury second. Crowd management, care of the patient's personal belongings, sending information to the police, and arranging for rapid evacuation, as well as the importance of arriving at a diagnosis, are subjects which should be drilled into a first-aid class before the study of detail is begun. They should be taught not to waste time waiting for a doctor, but to stop bleeding, apply splints and dressings, prevent wound shock, and get the patient to hospital or home as soon as possible. Chapters on anatomy alone are apt to be dull reading. Anatomical details are best interspersed among the various chapters, so that, for example, an account of the heart and blood vessels leads on to a description of the varieties of bleeding (not "haemorrhage") with their treatment.

The small manual by Drs. Naughten and Shanley is well printed and well illustrated, and is of a convenient size to fit the pocket. It provides a useful introduction to the subject. The Thomas splint for fractures of the lower limbs is briefly mentioned, but the "drill" which was published in the last war is not given. For wound shock the old term "shock" alone is used and the definition given is no longer accepted by competent authorities. The myth of the splanchnic pool was exploded in 1917. Organized treatment of wound shock in the resuscitation department of a first-aid post is mentioned under "war wounds." The importance of fluids, with or without blood or plasma transfusion, is not sufficiently emphasized. Under "artificial respiration" several methods of treatment are given. Schäfer's method should be taught dogmatically, and mention should be made of postural methods, either improvised or by apparatus such as the Eve-Riley rocker or the Tor tilter. The authors are to be congratulated on their brief reference to iodine. The use of iodine damages the wounded tissues, lessens their resistance to organisms, and produces effects of irritation. One day iodine will be discarded as an application to wounds and viewed with the same abhorrence as the use of boiling tar and the actual cautery of the Middle Ages.

Major Hammer's little volume is written with special reference to the casualty services now actively engaged in this country. The author writes with authority and knowledge, and stresses in Section X the need for a sound understanding of the basic principles as taught in the standard first-aid textbooks. No index is included,

but a full table of contents appears on page 3. Asphyxia is fully described, but no mention is made of artificial respiration by postural methods. Mouth-to-mouth transpiration is recommended for collapse of the lungs from blast. Case reports of treatment by this method will be awaited with interest. Blast generally kills by lacerating the lungs and all other hollow viscera. Full details are given of the first-aid services in action, and the book should be read by all doctors engaged in the work of the casualty services.

FACTS AND PROBLEMS OF SEX

The Physiology of Sex and its Social Implications. By Kenneth Walker. Pelican Books. (Pp. 157. 6d.) Middlesex: Published by Penguin Books.

A busy medical practitioner is wise if he keeps a look-out for the publication of the "Penguin" and "Pelican" books and specials. He will not infrequently find among them small volumes which contain much that he will like to know about current health and social movements and problems; and thus, with relatively little expenditure of time and at negligible financial cost, be able to make himself familiar with matters in which many of his more intelligent patients are interested and about which they are likely to seek his opinion in the course of consultation or conversation. Among the most recent of such publications is *The Physiology of Sex*, by Mr. Kenneth Walker. The author is a consultant surgeon well known as an earnest student of such questions as are indicated by this title, as a clear thinker, and as a forceful writer. The qualities which these adjectives indicate are evident throughout this book. It is scientific, sincere, clearly arranged and expressed, and impressive. As the author says in his preface, much of the popular literature about sex is unsatisfactory. "Some of the books are unnecessarily crude, some so sentimental as to be nauseating, and a still greater number so seasoned with propaganda that the original nature of the dish is undiscoverable." It is satisfactory to find that in his own book he has escaped these dangers.

The full title of the book is *The Physiology of Sex and its Social Implications*. So long as the author is dealing with the anatomico-physiological aspects of this subject his exposition is admirable, and, indeed, could scarcely be bettered. This applies to the first five chapters. The rest of the volume is concerned with social and ethical problems relating to marriage, divorce, prostitution, and sexual deviations, and it concludes with a chapter on sex education. Here again the problems are clearly stated, and though none of them can be said to be quite adequately discussed, the very limited scope of the book must be allowed for. The really important feature of these chapters is the insistence on the application of physiological facts to these problems. This is too often ignored in such discussions, and the author has performed a service in emphasizing the need for it. In dealing with the problems themselves, however, he has not succeeded in what he describes as his chief aim—"to present the facts and to leave it to the reader to draw from them his own conclusions." He acknowledges that his own personality has repeatedly thrust itself forward. There is scarcely a problem in regard to which his opinon is not evident, and he has not escaped biased or unduly dogmatic statement. The futile eugenic effect of voluntary (or even compulsory) sterilization is obscured; the undesirable results of widespread contraceptive practice among the unmarried and young married persons are not considered; and both the Church and the Law have a stronger case than the author has anywhere allowed, however much one may differ from it. It is scarcely adequate to say, "The majority of churchmen still regard love outside wedlock as more reprehensible than hate inside it," and to leave it at that.

Notes on Books

Operative Dental Surgery, by Mr. J. P. PARFITT and Prof. W. E. HERBERT, has now reached its fourth edition (Edward Arnold and Co., 25s.). It reflects the many advances made since the third edition appeared in 1931, and the text has been largely rewritten to meet present-day conditions in practice and in teaching. There are many well-reproduced illustrations, and the work will no doubt enjoy continued popularity.

Dr. EDWARD F. GRIFFITH'S *Voluntary Parenthood*, with a foreword by Sir Humphry Rolleston, was on its first appearance noticed in these columns on July 24, 1937. It provides a survey of birth-control methods and a guide to the spacing of families. A cheap edition has now been published by William Heinemann (Medical Books), Ltd., at 2s. 6d.

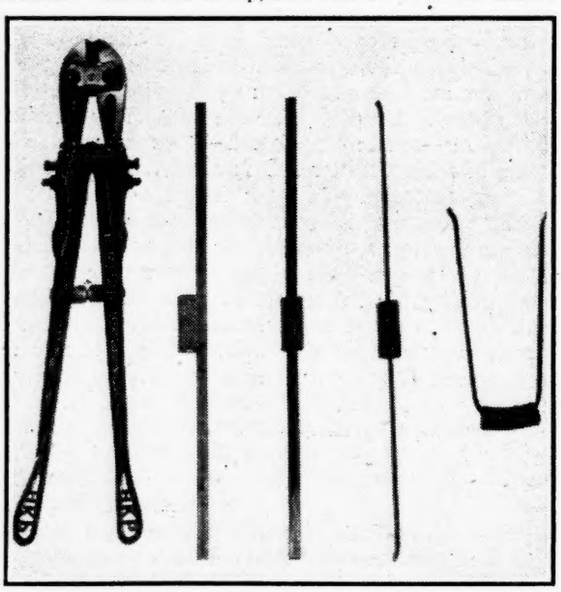
Preparations and Appliances

INEXPENSIVE WALKING-IRONS

Mr. P. ROUX, M.Ch. (Orth.), F.R.C.S.Ed., honorary orthopaedic surgeon to the Groot Schuur Hospital and clinical lecturer in orthopaedics at Capetown University, writes:

In the *Journal* of July 20 (p. 87) there is an article by Major Eric L. Farquharson on the walking plaster cast. I think it will be interesting to your readers to know that we make our own walking-irons in the orthopaedic department of the Groot Schuur Hospital at a very low cost (3d. to 4d. each before the war).

We buy 16-ft. lengths of mild steel, 1 in. by 1/8 in., and our porter cuts up 22-in. lengths with a pair of pliers as illustrated. These are cheap, and can be obtained from any



tool-maker. The hose I use is of the seven-ply 1/2-in. bore variety, and after threading a piece about 2½ in. long over the iron bar the ends of these are bent as shown. The iron is next bent as it passes through the rubber, so that this rubber cannot rotate on the bar. This stirrup is shaped by hand to the plaster cast in the ordinary way, and a plaster bandage is used to fix it to the cast. The bandage gets an extra turn round the projecting ends of the iron. This stirrup is applied in the way described by Major Farquharson.

For ordinary use I find that this special multiple-ply hose lasts seven to eight weeks, which is the common period for which the plaster cast is required. It will be possible to obtain hose with an even greater number of "ply" should this rubber wear out too soon. I have not found that this rubber has a tendency to slip on a wet surface. We have been using these irons for the last year or two, and find them satisfactory and cheap, and they do not require any special knowledge to prepare.

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THE TRANSFUSION PROBLEM

The war has been a stimulus to the therapeutics of haemorrhage and shock and has focused attention on two important lines of therapy: the use of oxygen and the transfusion of fluid. In the 1914–18 war Bayliss developed the gum-saline medium for transfusion. Some such measure was needed to counteract the rapid loss of transfused saline through the kidney. Fresh blood as a transfusion fluid was used at the end of the last war, and has since then been increasingly so employed. It serves four main purposes: the treatment of acute haemorrhage, when an oxygen carrier is needed; the treatment of secondary or wound shock, when the blood pressure, low because of loss of fluid, has to be raised and maintained; the treatment of anaemias, primary and secondary, when haemoglobin and the immunity mechanism in the cells and plasma proteins need restoring; and, finally, the treatment of chronic haemorrhage, in which all the three above desiderata are met with. One great disadvantage of transfusion with fresh blood is that a donor of the correct group has to be "on tap" when needed—a disadvantage that loomed large in the minds of those who foresaw the possibility of using blood transfusion on a wide scale, as, for example, in war.

Before the outbreak of the present conflict Soviet surgeons tackled the problem by forming "blood banks" of cadaver blood, and in the Spanish Civil War surgeons started a blood-bank system of stored preserved blood. The difficulty of transfusion on a wide scale was overcome, as large stocks of stored blood could be laid up. But the solution of one problem brought others in its train. Blood banks can only be made of the two most common and useful groups—O and A. Stored blood was apt to cause alarming and dangerous reactions; it was limited in usage and in source to the two groups O and A. Another problem was the anticoagulant fluid. Sodium citrate has been used almost universally; heparin, the natural anticoagulant of the body, has not been found to be superior either as an anticoagulant or as a preservative, and its higher cost is another drawback. As a preservative sodium citrate left much to be desired, though excellent as an anticoagulant. The recipient showed varying degrees of reaction, alarming but rarely fatal. These included rigors, severe headaches, acute muscular pain, haemoglobinuria, jaundice, urticaria, and pyrexia—which was apparently not always of infective origin.[1] [2] Attempts to prevent these reactions have been made in three ways: study of the changes occurring in the blood on storage, addition of antiseptics and preservatives, and improvements in technique. Technical advances include careful attention to correct blood grouping, absolute sterility of reagents, exacting standards of purity of the distilled water used for the citrate solution, and the temperature of administration. Blood warmed to 40° C. (entering the patient at 31° C.) was better than blood entering between 8° and 15° C.[2] Examination of the blood during storage showed that there was a progressive increase in fragility and haemolysis of red cells,[3] that potassium and inorganic phosphate were liberated from the red cell independently of its haemolysis and of one another,[4] [5] and that the permeability of the red cell apparently changed before haemolysis and the liberation of haemoglobin. The white cells disappear almost entirely by the fourteenth day, but neutrophil granulocytes within four days.[3] [6] Although these changes could not always be clearly explained they accounted for many of the reactions. Attention was therefore given to preserving the blood more efficiently. The addition of the recognized antiseptics was of no avail, but observations[7] on the use of sulphanilamide as a preservative are promising. Ironically enough, it took nearly six months of this war to rediscover the observation of Peyton Rous and Turner,[8] in 1916, that glucose added to the citrate prolonged the life and stability of the red cell and diminished the toxicity of stored blood; Robertson[9] in 1918 described in these columns its use in France for stored blood. According to Wilkinson and his colleagues[4] the action of glucose is to maintain cell metabolism and to retard the degradation of the organic phosphate. Despite the addition of glucose, however, stored blood cannot be kept beyond a fortnight for average use. Beyond this time the incidence of reactions tends to rise, but it is still a useful and justifiable procedure to transfuse blood a month old in an emergency.[1] In a recent description of blood transfusion in the B.E.F. W. d'A. Maycock[10] recorded "an extreme instance" in which blood seven weeks old was successfully transfused.

As the cells are the principal source of reaction attempts have been made to use either citrated plasma or serum, the cells being removed immediately after bleeding. Their only disadvantages are that they are not the best fluids to transfuse when the oxygen-carrying capacity is acutely defective or immunity is low. If, however, the blood volume is restored, then the recipient's own cells, and oxygen therapy, will tide the patient over the acute stage. Serum or plasma will increase and maintain the blood volume (by reason of their proteins) and consequently raise the blood pressure; they contain immunity substances. Serum differs from plasma in the absence of fibrinogen, but this is only one-thirtieth of the total plasma protein. Clinically it has been found that plasma and serum are equally effective; the recipient's own clotting mechanism is, with proper surgical treatment, adequate to prevent

[1] De Gowin, E. L., and Hardin, R. C., *J. Amer. med. Ass.*, 1940, **115**, 895; *British Medical Journal*, 1940, **2**, 1.

[2] Brewer, H. F., Maizels, M., Oliver, J. O., and Vaughan, J., *British Medical Journal*, 1940, **2**, 48.

[3] Dubash, J., Clegg, O., and Vaughan, J., *British Medical Journal*, 1940, **2**, 482.

[4] *Lancet*, 1940, **1**, 685.

[5] Downman, C. B. B., Oliver, J. O., and Young, I. M., *British Medical Journal*, 1940, **1**, 559.

[6] Crosbie, A., and Scarborough, H., *Edin. med. J.*, 1940, **47**, 553.

[7] Hunwicke, R. F., *British Medical Journal*, 1940, **2**, 380.

[8] Rous, P., and Turner, J. R., *J. exp. Med.*, 1916, **23**, 219.

[9] *British Medical Journal*, 1918, **1**, 691.

[10] Ibid., 1940, **2**, 467.

haemorrhages when serum is used.[11 12] Plasma has the disadvantage that it cannot be sterilized with a Seitz filter, for the citrate gets neutralized and clots tend to form. Serum has no disadvantage compared with plasma, and for transfusion purposes is superior in two respects to blood. First, in the absence of cells it keeps longer and need not be discarded if not used. Secondly, the serum from a donor of any group can be transfused into any recipient with the assurance that agglutination is most unlikely to occur provided the usual quantities of fluid are transfused, as agglutinins of the donor are diluted by the recipient's plasma and so are incapable of agglutinating his cells. We might here quote the observation of Best and Solandt[13] in a recent issue of the *Journal*: "We wish to emphasize the point that plasma and serum free from reaction-producing substances are physiologically and therapeutically identical and may be used interchangeably."

The latest innovation is the use of "reconstituted serum" or "reconstituted plasma." Serum or plasma separated from the clot or cells is dried and kept in this state for solution in distilled water when transfusion is required. They can therefore be packed in small bulk; being chemically dry they do not perish, and so can be transported to another climate at any time and any distance from the original donor.[14] Here the excellence of the results depends on the solubility of the dried product; this, in turn, depends upon the technique of drying the plasma or serum. The essential point is that in the drying process the proteins should not be denatured—that is, rendered into insoluble coagula, which essentially is the production of insoluble hydrates. They are formed in varying degree if concentration occurs at room temperature, but are not formed if concentration occurs at a temperature low enough to stop the chemical change of hydration or denaturation. Knowledge of denaturation we owe to the late Sir William Hardy, and Dr. and Mrs. Adair have worked out its application at Cambridge. Shackell[15] introduced a practical method of drying proteins based on these principles; R. I. N. Greaves and Mrs. Adair[16] have much improved the details and the product, and have shown how large quantities of dried serum or protein can be made by the use of high-vacuum condensation, which dries the solutions after freezing to a degree never previously achieved. The product is almost instantaneously and entirely soluble. Alternative methods of preparation have been described, including one by Edwards, Kay, and Davie[17] and those described in our current issue at page 583 by Aylward, Mainwaring, and Wilkinson.

There is now every reason to hope for a big and permanent improvement in the treatment of those conditions involving loss of fluid by the circulatory system. It remains for the clinical experience of the medical profession to determine which fluid is the best for different conditions—haemorrhage, shock, burns, or other miscellaneous conditions for which transfusion may be called upon as a life-saving measure.

[11] Best, C. H., and Solandt, D. Y., *British Medical Journal*, 1940, **1**, 779, and **2**, 116.
[12] Clegg, J. W., and Dible, J. H., *Lancet*, 1940, **2**, 294.
[13] *British Medical Journal*, 1940, **2**, 116.
[14] M.R.C. War Memorandum No. 1, The Treatment of Wound Shock (1940). H.M.S.O., London.
[15] *Amer. J. Physiol.*, 1909, **23**, 325.
[16] *J. Hyg.*, Camb., 1939, **39**, 413.
[17] *British Medical Journal*, 1940, **1**, 377.

INFECTION IN THE SHELTERS

Various aspects of the shelter problem were discussed in our issues of October 5 and 12, but no excuse is needed for returning to a question that is still causing grave anxiety to all who are concerned with the public health. The facts must be faced. The demand for large-scale shelters, where those without adequate protection at home can spend all the hours of winter darkness, is insistent and inescapable. Since few special shelters of this type have been designed and provided we must, at least in the near future, rely on improvisation. Improvisation, even when hasty, need not be inefficient; and we are supposed as a nation to have special talents in this field. They will be severely taxed. Unless we face our task realistically, calculating our risks and taking only those that we must, the tax will pass the breaking point. We shall, if we are wise, budget for a large increase in infective disease whatever precautions we take. We have, epidemiologically, come very lightly out of the first year of war; but if we escape equally lightly from the effects of herding millions in overcrowded shelters during all the hours of this winter's black-out we shall be fortunate beyond belief. Relying less on miracles than on ourselves we should, therefore, do all that we can to make bad a little less bad, without any delusion that we can make it good.

What in fact can we do? The risks are obvious enough—inadequate sanitation following a summer and autumn during which paratyphoid, though fortunately not typhoid, has been unusually prevalent; all the conditions for heavy louse infestation, with its risk of louse-borne diseases; above all, perhaps, conditions that could hardly be more favourable to the spread of droplet and air-borne infection of every kind. The rules for preventing, or lessening, the spread of such infections are quite well known; but it is of little service to recite lists of sanitary requirements, spacing of bunks, and so on, that bear no relation to immediate possibilities. We shall be wiser to concentrate on things that we *can* do. We can insist that the construction, conditioning, and equipment of shelters are a medical at least as much as an engineering problem, and that no borough engineer shall be allowed to make plans, still less to carry them out, independently of the medical officer of health. In this way we can secure that sanitation, bunk-spacing, and ventilation are no worse than they need be. We can make better use than we have done of modern methods of controlling louse infestation. Against certain diseases, of which diphtheria is certainly one, small-pox another, and enteric fever perhaps a third, we can employ the proved methods of protective immunization. We can, as has often been suggested, do much to reduce the special risk of pulmonary tuberculosis by evacuating all known active cases to areas where shelters are unnecessary. We can perhaps, though much less certainly, do a little to reduce the risks of acute respiratory infections by the use of bactericidal sprays, or of gargles, or of masks if people can be induced to wear them. But of all the things we can do the most important is to maintain a steady watchfulness, realizing that our problems will change from day to day and from place to place, that the price of a few missed cases of certain infective diseases may be a major epidemic, and that

an active, intelligent, and unhampered epidemiological service, including clinicians and bacteriologists working as a team, can often handle exceedingly awkward situations without disaster. All necessary facilities must be provided for the earliest possible diagnosis of every case of infective disease. The hospitalization of such cases must reach a far higher level than in peace, and must extend to diseases normally treated at home, since many will have no homes in which they can be safely nursed. We have so far escaped air-raid casualties on the scale for which the authorities had prepared. Perhaps the real test of the Emergency Medical Service will come on the medical rather than on the surgical side.

Things being as they are, there is much encouragement in the fact that Lord Horder's committee is still in being; that some at least of its recommendations, though undisclosed, are apparently being implemented; that the larger shelters will have medical practitioners in nightly attendance; and that the Minister of Health and Minister of Home Security show every sign of tackling the problem with promptitude and courage rather than in the more conventional spirit of Whitehall. When trouble comes we shall do no good by hunting for scapegoats; and we shall be unjust if we bring any charge against those who have done their best in a situation that was none of their making, and was in part beyond the control of any man. What would now be intolerable would be that such things as we can still do should be hindered at any point by squabbles as to whether the Treasury or the rates are to meet some relatively minor expenditure, or whether this or that local authority is responsible for particular services in particular areas. The situation is ugly, but the medical profession, supported by Ministers and by a Government determined to cut out bureaucratic obstruction from whatever quarter it comes, can face it. Without that support the outlook would be much uglier than it is.

THE BETTS VISUAL TESTS

It is sometimes necessary, in the absence of enough doctors, for school nurses and teachers to make the first rough tests of the eyesight of school children, and a stereoscope with various slides (known in this country as a stereosette) has been recently advocated for this preliminary detection of defective sight, the material used being the D.B. series of the Betts Visual Sensation and Perception Tests. The reports received of these tests, however, varied widely; some were enthusiastic, others condemnatory. Some of the examiners found that nearly all the children had defective eyesight, but subsequent investigation by ophthalmologists did not confirm these findings. Again, many children seen by sight-testing opticians were ordered plane lenses or plus 0.25 D spheres. This method of examining eyesight is attractive for its simplicity and novelty and because it includes tests to detect lowered visual acuity and disturbances of binocular vision. In view of the varying reports received, however, the Massachusetts State Department of Public Health sponsored an investigation by the Division of Child Hygiene.[1] Two groups each of one hundred children were examined: the first group included children from 9 to 15 years suspected of having defective vision by their teachers; the second, children of similar ages taken from the classes at random. The eyesight of all the children in both groups was tested by the stereoscopic method by competent nurses, who carried out the instructions accurately. Later, all 200 children were examined by an ophthalmologist, who as a check re-examined some of them one month later, usually without knowing that he had seen them before, and always without reference to his first records; there was no variation in his findings. The stereoscopic test was also repeated by the same nurses, when the results generally agreed with those obtained in the first instance. There was, however, no such agreement between their findings and those of the ophthalmologist. In the hundred children suspected of having defective vision only three passed the instrument test; of the remaining ninety-seven who failed or who were classed as "doubtful" the ophthalmologist passed fifty-two. In the hundred taken at random eleven passed the instrument test, of whom ten were passed by the ophthalmologist, but of the remaining eighty-nine it was found that seventy-three had satisfactory vision. This comparison of the results of these two methods indicates that this "vision-testing instrument" dispensed to and used by schools does not "screen out" the children who should be referred to an eye specialist for examination. It may be pointed out here that the test as practised by the nurses and teachers in the investigation was recommended for use by welfare workers in England. The Ophthalmic Group Committee of the British Medical Association did not, however, recommend it.

[1] *Arch. Ophthal.*, 1939, **22**, 832.

BACTERICIDAL ACTION OF NORMAL SERUM

Further investigations of the nature of the bactericidal substances found in the sera of mammals, birds, reptiles, and amphibians have recently been reported. According to Miller[1] the serum of reptiles such as snakes and alligators has the greatest bactericidal action, inhibiting the growth of a wide variety of organisms, including members of the typhoid, paratyphoid, and dysentery groups, as well as *Brucella*, *Proteus*, and *Pasteurella*. The bactericidal action of normal serum, as was originally shown by Gordon and Wormall,[2] is due to the combined action of a thermostable amboceptor-like component and a thermolabile complement-like component. Tests on the sera of very young animals show that the sera of three-day-old rabbits and one-day-old chicks and kittens possess bactericidal action. In addition, the serum of eighteen-day-old chick embryos shows some bactericidal effect, though this is absent from the embryonic fluids. As it is hardly conceivable that specific bacteriolysins could arise in such young animals as a result of clinical or subclinical infections with an enormous variety of bacteria, the existence of true natural antibodies must be conceded. Absorption experiments with the sera of cats and alligators show that the thermostable component of the serum bactericidin is at least partially specific—a view put forward by Mackie and Finkelstein.[3] Considerable non-specific absorption, however, takes place. Gordon and Johnstone[4] have also studied the effect of absorption on the bactericidal action of human, guinea-pig, and rabbit serum with a number of strains of the gonococcus, *Vibrio cholerae*, and *Micrococcus catarrhalis*. Contrary to the results obtained by Abdoosh,[5] they find that normal human serum does possess a bactericidal action on the gonococcus, although the effect is relatively weak when compared with that of guinea-pig and rabbit sera. Absorption of a normal serum with a series of strains of the same bacterial species causes general diminution in the bactericidal power of the serum for all strains, but a more striking diminution

[1] *J. Bact.*, 1940, **40**, 333.
[2] *J. Path. Bact.*, 1928, **31**, 753.
[3] *J. Hyg.*, Camb., 1931, **31**, 35.
[4] *J. Path. Bact.*, 1940, **50**, 483.
[5] *J. Hyg.*, Camb., 1936, **35**, 355

for the strain with which the serum was absorbed. As no specific growth-promoting factors are introduced during the process of absorption (a suggestion made by Gordon and Hoyle[6]) it follows that in normal serum either there must be both species-specific antibodies and a vast number of strain-specific antibodies capable of individual absorption, or there is a general bactericidal antibody which by contact with an excess of any particular organism or strain can be so modified as to render it specifically inactive for that organism or strain. In either case the apparent multiplicity of antibodies in normal sera suggests a method for determining antigenic differences between strains of organisms susceptible to the bactericidal action of normal serum.

THE RORSCHACH TEST

It is a commonplace that satisfactory clinical or laboratory tests of temperament and character are hard to come by, and that even the least unsatisfactory of these are much less efficient than the tests provided by everyday life. The quest for a means of investigation of temperament and of measuring the strength of its components has proved more elusive even than the search for objective measures of bodily fatigue has been to physiologists. The psychiatrist is inclined, therefore, to depend mainly on careful history-taking for his estimates of personality. This is sensible enough, as the history is the record of the patient's reactions to real situations, especially as it includes subjective data as well, in the statement of what the patient actually did in certain conditions. Intuition, of course, cannot be left out even here. How much it enters varies with the psychiatrist's own aptitude and personality. Its basis and value have in general been insufficiently determined. There is room for the systematic study of intuition in relation to clinical work. The two main categories of psychological tests of temperament are respectively the verbal and the performance type. The pronounced limitations of the former have been discussed at length by P. E. Vernon.[7] Performance tests can either represent artificially a real situation, as in certain tests for aptitude in motor driving; or they can abstract, as it were, from a real situation certain aspects, such as the need for speed in response. In both kinds of performance tests the temperamental functions that are most often important clinically, the affective ones, are not tapped, just because the situation is artificial. On the other hand certain qualities of a simpler kind, such as perseverance and meticulousness, can be to some extent observed. One of the few "tests" or, to use an Americanism which is more apt, "probes" of temperament that have won wider attention with the passage of time is the Rorschach ink-blot method. Interpretation is nearly everything in this method; and the interpretation depends enormously on intuition. The basic assumptions of the method are such as these: preoccupation with small details of the blot suggest a critical outlook; while a high percentage of answers connected with the white spaces in the blots may indicate a negative attitude towards the world. Such judgments are reminiscent of the assumptions of graphology; but the fact that they are intuitive should not mean that they deserve no scientific attention. In evaluating the test, however, this fundamental reliance on intuition must be remembered. The Rorschach method claims to decipher fundamental traits in the personality; but there is evidence that the results are at least disturbed by transient and non-essential mental states. If sometimes these results appear to be clouded with verbiage, that is partly because the language itself of the emotional aspects of experience is faulty and the conceptions vague. The clinical claims made for the Rorschach test—for example, that by its means it is possible to make a differential diagnosis exceeding in refinement in some cases what is possible by clinical methods—deserve more scrutiny from psychiatrists generally than they have yet received. For example, the possibility of distinguishing by this means a truly traumatic mental syndrome[8] from one independent of the physical after-effects of brain injury deserves close attention. In psychotherapeutic work the ink-blots may at least stimulate associations otherwise unobtainable, while at the same time suggesting the presence of certain general characteristics in such a way as to make the test to the psychotherapist what the chart is to the mariner. In treatment by shock methods[9] it has been used to serve as an objective record of progress. These are no small claims; the disadvantages are the time occupied by the interpretation, the very subjective nature of the latter, and the arbitrariness of certain norms. Often it seems to be an unusually tedious way of finding what might be discovered by a skilled interview, but there is evidence that there are occasions when it is capable of giving deeper information than the interview, and in a shorter, not a longer, time. The method deserves wider interest than it has yet been accorded here.

EXPERIMENTAL CIRRHOSIS OF THE LIVER

The nature of the process by which multilobular cirrhosis of the liver is produced is still disputed. Alcohol alone cannot cause it; the disease occurs in those who never drink it, nor will alcohol produce it experimentally in animals. Various impurities in liquor have been held responsible, and even condiments; while those who are unconvinced that any of these substances can of themselves produce the requisite damage conclude that bacteria or toxins of intestinal origin co-operate in the process. Whichever variant of these explanations be accepted, the underlying idea in all of them is the action of a poison. That alcoholic cirrhosis could be a deficiency disease, owing its origin, whether in the alcoholic or, more uncommonly, in the abstainer, to a diet lacking in some constituent essential for hepatic nutrition, is a possibility which has not been considered. Observations by A. R. Rich and J. D. Hamilton,[10] although only of a preliminary nature and concerned with one animal species, distinctly suggest that this may be the true explanation of the disease. Their original observation appears to have been accidental, since it occurred during studies of the influence of dietary factors on resistance to infection. Rabbits fed on a grossly deficient diet and dying in from thirty-eight to eighty-one days after the beginning of the experiment were found to have cirrhotic livers. Further groups of rabbits were given a basic diet with a higher protein content and various supplements, and again cirrhosis was produced in certain groups, although less weight was lost and most of the animals survived until the sixty-fifth day, when they were killed. The disease was not prevented by vitamins A, D, E, B_1, B_2, or B_6, but did not occur in those given yeast; there is therefore an unknown factor in yeast which must be the clue at least to this experimental condition. The cirrhosis produced was of the characteristic Laennec type, and the authors emphasize their difficulty in identifying necrotic liver cells, in spite of the fact that many must have been degenerating in order to produce the condition found; in

[6] *J. Path. Bact.*, **43**, 545.
[7] *The Assessment of Psychological Qualities by Verbal Methods.* Med. Res. Counc. Industr. Hlth. Res. Bd. Rep. No. 83. H.M. Stationery Office, 1938.
[8] *Arch. Neurol. Psychiat.*, 1940, **43**, 859; *J. ment. Sci.*, **86**, 366.
[9] *Psychosomatic Med.*, 1939, **1**, 508.
[10] *Johns Hopk. Hosp. Bull.*, 1940, **66**, 185.

this anomalous feature the disease exactly resembles that in man. Some of the animals also developed ascites. It will, of course, be necessary to extend this study to other species of animal before any conclusions referable to man can be drawn from it, but even at its present stage the results are highly suggestive. The hypothesis that alcoholic cirrhosis is a deficiency disease surmounts the graver difficulties in the way of accepting the old idea of a primary toxic action on liver cells—notably the occurrence of cirrhosis in non-alcoholics and its frequent absence in spite of alcoholism the degree and duration of which merit its development. It scarcely needs to be added that peripheral neuritis in alcoholics was at one time regarded as due to a direct toxic action on nerves, whereas it is now well recognized to be due to a deficiency of vitamin B_1. It will indeed be strange if yeast, which originally produces alcohol, also furnishes the antidote to some of its worst effects.

PANTOTHENIC ACID AND NECROSIS OF ADRENALS

Since pantothenic acid (the chick anti-dermatitis factor) has been prepared synthetically it has become possible to investigate its action on the animal body without complications arising from impurities in even very concentrated extracts. Daft and his co-workers[1] have recently given forty-eight rats a diet of purified casein, cod-liver oil, Wesson oil, salt mixture (Osborne and Mendel's), and sucrose. After ten to fourteen days each rat was given daily supplements of 20 μg. riboflavin, 15 μg. thiamin chloride, 10 μg. pyridoxine hydrochloride (vitamin B_6), 2 mg. choline, and 1 mg. nicotinic acid, which produced a temporary gain in weight (two to three weeks). Thus the rats had been given ample supplies of all substances known to be necessary for health except pantothenic acid. In a previous annotation[2] we drew attention to the degeneration of nerve fibres in the spinal cord of chicks deprived of pantothenic acid. Six to ten weeks after the beginning of the experiment nearly all the rats showed the usual signs of deficiency of the "filtrate factor" in varying degrees of severity—nose-bleeding, sticky exudate on the eyelids, and depilation about the nose. They were then divided into groups: the rats of one group were given no further supplement; those of the other groups were given synthetic pantothenic acid daily in these amounts: (*a*) 100 μg. for six days, (*b*) 100 μg. for ten days, (*c*) 100 μg. for fourteen days, and (*d*) 200 μg. for fourteen days, respectively. All the symptoms increased in severity in the untreated rats, while in the treated rats they decreased or disappeared entirely. The histopathology of the adrenals of these rats has been fully described by Ashburn.[3] Congestion was only slightly greater in the untreated than in the treated rats, and it was found mostly in the inner third of the cortex. Haemorrhage, atrophy, and necrosis occurred singly or in combination in ten of the sixteen untreated animals. Some calcium deposition was found in the necrotic areas. Fibroses and deposition of haemosiderin were present in nearly all animals, both treated and untreated, but were rather more obvious in the latter. The fat content of the adrenals was much reduced in the untreated animals. Apparently the testes of all the rats had been damaged before dosing with pantothenic acid had begun. The administration of this substance brought about slight improvement, but did not in this experiment restore them to normal, though in two rats of another experiment treatment for thirty-eight days had been successful. When pantothenic acid was withheld from the diet for some days the rats ceased to grow. When it was again given the tibial epiphysial cartilages became hyperactive. The spleen and pancreas were apparently not affected by a deficiency of pantothenic acid.

[1] *Publ. Hlth. Rep.*, Wash., 1940, **55**, 1333.
[2] *British Medical Journal*, 1940, **2**, 230.
[3] *Publ. Hlth. Rep.*, Wash., 1940, **55**, 1337.

POST-HYPOGLYCAEMIC COMA

Unconsciousness and coma associated with insulin hypoglycaemia are well known, and are induced occasionally and involuntarily in the treatment of diabetes, and frequently and purposely in the treatment of schizophrenia with insulin. The coma results directly from the reduction of blood sugar, and usually disappears as soon as the latter is raised to normal by the administration of glucose. Occasionally cases are met in which the coma persists for hours or even days after restoration of the blood sugar to adequate levels; rarely, irreversible degenerative changes appear in the brain and lead to a fatal issue with no recovery of consciousness. Goldman[1] calls this late reaction "post-hypoglycaemic coma," which occurred in 17% of 108 patients treated with doses of 30 to 150 units of insulin. In post-hypoglycaemic coma Babinski's sign cannot be elicited and the corneal reflex is absent, even when much motor excitement is present—an association never found in the phase of true hypoglycaemia. Goldman describes three characteristic features of the condition. Hyperventilation, both hyper- and tachy-pnoea, develops and soon leads to over-breathing tetany with intense motor excitement, rigidity, and spasms—the most dramatic symptoms in the condition. These can be relieved, at least temporarily, by intravenous injection of calcium or rebreathing into a bag to prevent the loss of carbon dioxide. Hyperthermia soon appears; the temperature may rise 2° to 5° F. in an hour, and seems to depend on the degree of muscular over-activity. Other occasional features are blotchy erythema of the skin and oedema of the lungs. If untreated the condition lasts for at least fifteen hours and may go on for days. None of Goldman's cases proved fatal, but deaths have been reported elsewhere, probably either from hyperthermia or from pulmonary oedema. A few chemical studies were undertaken during the condition, but not sufficient to give a complete picture. The blood sugar was normal or high, the calcium and phosphorus values were normal, and the chloride perhaps slightly low, but haemoconcentration was certainly present, presumably due to the intense sweating. Why some patients should fail to recover from hypoglycaemia after taking sugar and should develop the above syndrome is not explained. In the treatment it is stressed that antipyretic measures are most likely to cut the condition short, and Goldman has been impressed with the value of two other steps. He now gives large amounts of physiological saline solution (a litre or more), presumably to remove the haemoconcentration, and also large doses of adrenal cortical hormone intravenously (3 to 10 c.cm. of eschatin was used). This step was suggested by the fact that one case of prolonged coma showed transient bronzing, suggesting adrenal cortical deficiency, but no other investigations of sodium chloride potassium balance or vascular tension have yet been undertaken to study this hypothesis further.

Sir Edward Thornton has been appointed Director-General of the Medical Defence Services of the Union of South Africa.

The King has appointed Dr. William Norwood East, F.R.C.P., to be one of the Commissioners under the provisions of the Prison Act, 1877.

[1] *J. nerv. ment. Dis.*, 1940, **92**, 157.

ECONOMY IN BARIUM MEAL EXAMINATIONS

BY

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The Duke of Wellington, when asked how he always succeeded in defeating his enemies, is said to have replied that, whereas their equipment was so cumbrous that it was only suitable for a prearranged plan, his own was simple and in consequence readily adaptable to changes in the military situation. The Duke's words provide us with a lesson which is specially applicable at a time when diagnosis is becoming more and more dependent on the use of apparatus. As radiology advances much ingenuity is being displayed in the production of single plants capable of performing all the ever-increasing types of operation that may be required. The result has not always been successful. The inevitable complexity has tended to obscure the distinction between essentials and non-essentials, between what is common and what is rare, to make complex and costly things which are really simple and should be much cheaper, and, worst of all, to make the operator the servant, not the master, of his machine.

This is especially true of methods now in vogue for gastro-intestinal examinations. The incidence of dyspepsia among our troops involves the necessity for radiological investigations on a large scale. At the same time the need for economy in material of all kinds makes it imperative that such investigations should be carried out as cheaply as is consistent with accuracy and efficiency. Reports made by many young radiologists often quite unnecessarily cover the whole intestinal tract from the oesophagus to the sigmoid, describing the course of the meal at intervals of a few hours, the shape and size of the stomach and the disposition of the colon. In examining the gastro-intestinal tract, and for that matter any system, the following two principles should be borne in mind. First, where there is a conflict between the anatomical and the physiological criterion, the physiological criterion is always the more reliable. The size and shape of the stomach, whether it is "hypertonic, orthotonic, or hypotonic," are of little significance except in so far as the condition can be shown to be associated with disturbance in the capacity of the stomach to fulfil its functions properly. This happens only in cases of extreme hypotonia. Secondly, the range of individual physiological as of anatomical variation differs so widely that clinical deductions should be made only with the greatest reserve and after taking all the circumstances into account. The rate of emptying of the stomach, for instance, not only is subject to wide individual variation but is also determined by the posture of the patient. Again, the so-called delayed emptying of the appendix is of doubtful significance in view of the wide range of the normal. Diffuse examination, apart from putting the patient to much discomfort, takes up a great deal of time and involves the use of a number of large films. But the greatest disadvantage is that it tends to distract attention from those abnormalities which are most likely to be found. In men of military age, and for that matter in the whole community, the commonest disorders for which information is sought are gastric ulcer, duodenal ulcer, and chronic appendicitis. One of these having been discovered, investigation of the rest of the tract is usually superfluous. In the majority of cases all three conditions can be adequately demonstrated on two or three half-plate films. I shall confine my remarks to examination for gastric or duodenal ulcer.

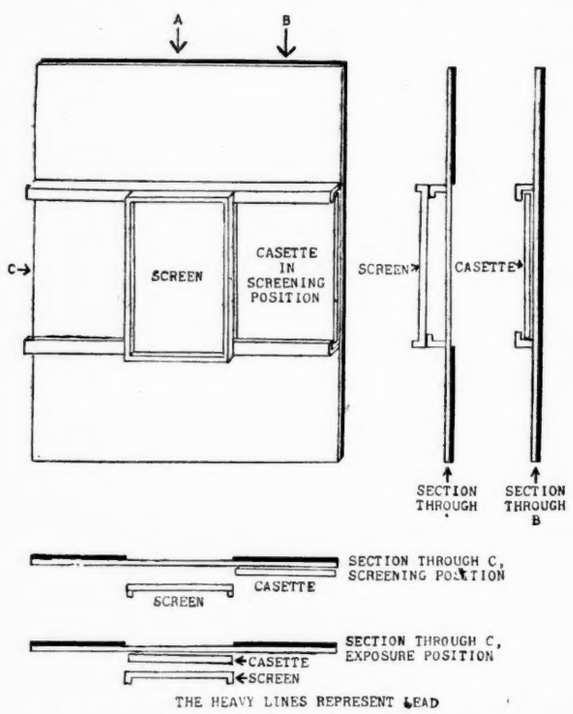
Gastric Ulcer

A fact which is not always realized by clinicians is that a single film apparently depicting a normal stomach is in itself no evidence of the absence of an ulcer, since the ulcer may be eclipsed by the lumen of the stomach in front of or behind it. Complete photographic proof of the absence of an ulcer would need innumerable films taken in all directions. Having found an ulcer by screening, the radiologist should take films first with a small quantity of barium to demonstrate the disturbance in the arrangement of the rugae, and then with the stomach full of barium to demonstrate the true size of the ulcer. For the latter the patient should have been rotated into that position which brings the ulcer into maximum relief. Since most ulcers are situated slightly posterior to the lesser curvature this usually means that the patient is turned slightly to his left.

Duodenal Ulcer

The discovery and demonstration of a duodenal ulcer is probably the most difficult manœuvre which the radiologist has to perform. Whereas the appearance of a gastric ulcer remains stationary and is not influenced by peristalsis, a duodenal ulcer is only visible intermittently during the short intervals when the cap is full. In determining the presence of an ulcer in this situation the operator must screen in all directions and, having found evidence of a deformity or of a crater, must satisfy himself that the deformity is not due to extraneous causes and that it accords with the site of tenderness to palpation. Then comes the most difficult part—to produce a film at the moment when the deformity is visible. For this purpose it is essential that radiography should be carried out almost instantly after screening. Most screening-stands on the market make no provision for this to be done, with the result that by the time a casette is produced and placed in position the cap is empty. There is a device which enables the four quarters of a large film to be exposed in turn. The cycle of changes is thus caught in four phases, but, screening between the exposures being impossible, the exact moment when the deformity is most clearly demonstrated may still be missed.

The following method which I have devised meets the difficulty more efficiently. The ordinary large screen is removed from its frame, and its place is taken by the structure shown in the accompanying diagram. It consists of a board of five-ply wood across which run two horizontal strips of wood grooved on their facing surfaces so as to allow a half-plate casette to slide between them. To the middle third of the two strips a fluorescent screen of half-plate size is fixed in such a way that a space is left between the screen and the board into which the casette can slide. The whole is backed by 2 mm. of lead,



except the part behind the screen. It is essential that the switchboard be of the dual control type allowing a rapid change-over from the screening to the exposure position. The radiologist controls the screening current by means of a foot-switch while a radiographer is in readiness to make the exposure. During screening the casette is at the side of the screen and protected from the rays by the lead. At the appropriate moment the radiologist cuts off the screening current, calls "Ready," pushes the film behind the screen, and calls "Film" as a sign for the exposure to be made. During the short period between the signals "Ready" and "Film" the radiographer switches over from the screening to the exposure position. The advantages of this method are that the interval between screening and exposure is reduced to the minimum and that the radiologist can see the actual exposure on the screen and so knows whether it is correct or not. If necessary a compressor of loofah or other material can be attached; but I prefer to use the gloved hand, by means of which a finely graduated degree of pressure can be applied from below without obscuring the picture.

Apart from the screen the apparatus was made at a cost of a few shillings. Rarely are more than two or at the most three films necessary for the adequate demonstration of an ulcer. I suggest that if this simple device were adopted at all the Service hospitals the annual saving to the Exchequer would be considerable.

THE CONTROL OF LICE

BY

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Now that a considerable number of our people are sleeping crowded together in shelters it is likely that outbreaks of body and head lice will occur. Every medical man should know something of the insect's biology and the methods of control. The points which appear most important are here summarized. A full account of the whole subject, including its epidemiological side, has been recently published (Buxton, 1939).

Biology

In all lice the adult female lays eggs (nits), from which larvae hatch: these resemble adults except that they are smaller. The larvae grow and become adult males or females. On human beings we speak of "head lice" and "body lice"; the points of difference are very slight, and the life history and control are essentially the same. The "crab louse" or "pubic louse" is quite distinct from the others. All these three (head, body, and crab lice) are parasites of man and have no other host: every infestation comes from some other human being. The adults and larvae feed several times a day on blood alone. The whole life is generally passed close to the surface of the human body, the female sticking eggs to the hair of the head (head louse), or to the fibres of garments, particularly those next the skin, and to the hair of the trunk (body louse). Blankets are commonly infested with lice and eggs; furniture, walls, etc., so rarely that they are negligible.

At the temperature which prevails on the surface of the body (about 30° C., 86° F.) the egg stage lasts nine days, the larva lives nine days, and the adult about thirty days. The female lays eight to ten eggs a day—i.e., a total of about 250 eggs. A louse *might*, therefore, have 120 daughters and 14,400 granddaughters; even if the infant mortality is very high the rate of increase is surprisingly great after two or three generations.

Lice shun light, but probably move about rather freely at night. They spread readily when people are forced to live and sleep in a crowd, particularly if the washing of clothes and person is difficult. In England, in peacetime, I am convinced that more than 10% (and often over 30%) of the children in elementary schools in towns and cities have head lice; in rural areas the figure is much lower. Girls are more often infested than boys of the same age; the infestation is higher in children of school age than in babies, adolescents, or adults. In peacetime the body louse is much rarer than the head louse, and is difficult to find except among the destitute. There is little doubt that it is more widely spread now than it was before the war, though no outbreaks have yet been recorded.

In any lousy community there is a tendency for most of the infested people to have no more than ten to twenty lice: a small proportion have a few hundred lice, and still fewer may have a few thousand. In other words, many infestations are so light that they may be missed, but a few of the people are centres of dissemination.

Repellents and Preventives

Essential oils and other volatile substances have a definite repellent effect, but not strong enough to prevent a louse sucking blood. We do not know any repellent which is of practical value. It is true that, given a choice, body lice will live and lay eggs on a rough material rather than a smooth (e.g., wool rather than silk), but this does not prevent them from colonizing silk underwear. It is definitely established that people with long hair are more liable to be infested with head lice than those with short: long hair is also more difficult to deal with if infested. Female social workers and others exposed to particular risk should sacrifice appearance and use the scissors freely.

Control: General Points

As head and body lice can multiply rapidly and spread through a crowded community, control is useless unless it is radical. If a group of men have body lice one must deal with their persons and clothes, and generally bedding. If it is possible the whole group—e.g., all the people who habitually sleep in one shelter—should be deloused in one day. Similarly with the head louse, one would wish to inspect and perhaps treat the infested child's neighbours in school, and his elder sister or infant brother.

More attention should be given to teaching people about the louse and ways of dealing with it, for some of the trouble is due to lack of frankness and to a tendency to conceal infestation. Make use of the poster published by the Central Council for Health Education, and the Health and Cleanliness Council's leaflet, "Cleanliness of School Children."

It is important to detect light infestations. If one is looking for head lice the eggs are generally easy to find: the living egg is plump and opalescent, and generally fixed to the hair close to the scalp; the dead egg or empty shell is flat and dirty, and may have been carried far from the scalp as the hair grew. Eggs are often fixed to hair in the region behind the ears; they may also be inside the hat. Most eggs of the body louse are fixed on seams or folds on the inner surface of undergarments; eggs and lice are generally congregated in limited areas. At the least one should examine shirt or vest, even if the subject is unwilling to strip completely. Some eggs and lice may also be found on the surface of the body, and on outer garments, even on their outer aspect.

Control on the Person

If the scalp is infested it is advisable, though not necessary, to shorten the hair. It is quite possible to disinfest a head by thorough combing, giving particular

attention to the base of the hair and using a metal comb with very fine teeth set so close that lice are combed out and eggs crushed: such a comb is sold by Messrs. Sacker. Success depends on thoroughness.

It is generally quicker to use an insecticidal liquid poured on (the patient lying on the back, with the head projecting over the edge of a table), or applied by dipping an ordinary comb in the material. The liquid must reach all parts of the hair, down to the scalp. Use one of the following:

(*a*) Paraffin (i.e., lamp oil, kerosene) 74 parts, cottonseed oil 20 parts, tar oil (wood tar) 5 parts, oil of lemon grass 1 part (the last being optional).

(*b*) Equal parts of kerosene and a vegetable oil (cottonseed, linseed, etc.). Some types of kerosene are more insecticidal than others, so that this mixture may be unsatisfactory.

(*c*) Carbolic acid (phenol) 1 in 40 of water.

(*d*) Cresols are also frequently used. I understand that liquor cresoli saponatus fortis ("army cresol") is more satisfactory than liquor cresoli saponatus (lysol), because army cresol contains a higher proportion of phenoloids, which are less irritating to the skin: it is used 2%, with 2% soft soap, in water. The composition of liquids (proprietary or other) which contain cresols is very complex, and perhaps variable: it might be well to test the available material for its effect both on the louse and on the human skin.

Whichever of these is used tie the head in a towel and leave it one hour: then wash. Which method is most effective is not known.

The two following are also efficacious: alcohol (rectified or methylated) 7, water 3 parts; extract of quassia chips, made with boiling water, and used fresh. With either of these there is no need to tie up the head, the liquid being allowed to dry off.

Insecticidal powders may well prove to be of great value. The one that was used extensively in the last war—N.C.I. (96% naphthalene, 2% creosote, 2% iodoform)—is certainly effective against lice, but causes dermatitis on some people; it therefore tends to be insufficiently applied, and then is condemned as ineffective. I have been allowed to watch the recent experiments of Messrs. H. J. Craufurd-Benson and J. Macleod, entomologists to Messrs. Cooper, McDougall, and Robertson. They have tested a number of powders on infested tramps, whose garments were examined daily, and have produced two useful formulae, which will be published later. The first powder (known as AL. 16) is rather slow in taking effect, but otherwise very effective. The second (AL. 63) is similar but contains an additional constituent, which renders its action quicker, though it has a characteristic smell, which might be regarded as a disadvantage. Both powders hang about in garments, even if they are being worn, and continue to be effective for about a week. These powders appear equally suitable for the head or for garments, so far as can be judged at present. If used on the head the powder should be massaged down to the roots of the hair and excess brushed out, the eyes being shut. On garments, about 1 oz. suffices for shirt and pants, the powder being rubbed particularly into seams. As these powders are unlikely to kill nits two applications at a week's interval should be given.

Essential oils (including sassafras) are expensive and not particularly effective. The legend that vinegar or acetic acid loosens nits and enables them to be combed out was disproved twenty-five years ago: it dies hard. Many people think that dead nits are unsightly and must be removed. That is an aesthetic question—a matter for the hairdresser: to the doctor's eye a dead nit is a thing of beauty.

In dealing with the body louse, disinfest clothes, etc., as below: clip the hair, lather all over with soap and cresol (above), and take a bath. It is best to treat an infestation with crab lice in the same way: they generally occur on the pubic hair, but are not very rare in the scalp, axillae, etc.

Disinfestation of Garments, Blankets, etc.

The most convenient agent is heat. The following periods and temperatures are fatal to lice and eggs: five minutes 54° C. (129° F.); forty-five minutes 50° C. (121° F.). It is immaterial whether the heat is dry or moist, but it is essential that the whole of the infested material should actually pass the necessary temperature. Cotton garments, if washed in the ordinary way, are exposed to temperatures which are lethal to lice and nits. Alternatively soak them in 2% cresol for at least an hour at 16° C. (61° F.) or higher temperature. Woollens shrink if washed in water hot enough to kill the louse, and are more conveniently treated by dry heat. In a disinfesting machine arrangements are made to allow for penetration of heat through blankets, coats, etc., which are hung on racks. If something has to be improvised the proper distribution of heat through the chamber and the disposal of the garments on racks need careful thought. Many types of heating have been used in improvised chambers—e.g., braziers, steam from an engine, etc. Garments can be disinfested with a domestic hot iron, attention being given to folds and pleats. One ironer can deal with the clothes of one person in the period occupied by the bath, etc. As a practical test, if eggs and collapsed and shrunk and if lice are brittle, all is well.

At present fumigation is not a method to recommend, the necessary doses and exposures not being well enough known.

As the louse cannot survive starvation for long, clothing may be disinfested by storage. At all temperatures the egg stage lasts longer than the starved adults or larvae, so that one must store long enough to allow all eggs to hatch, and a few days in addition to ensure that the newly hatched larvae die. The following facts are published by permission of my colleague Mr. H. S. Leeson.

Temperature		Egg Stage	Safe Period
° C.	° F.	(Days)	(Days)
35	95	5–7	10
30	86	9–11	14
24	75	17–21	28

If maintained steadily at temperatures below 24° C. the egg cannot hatch, though it can develop and hatch later if the temperature is raised. The safe period below 24° C. is not exactly defined, but may be taken as a month.

Organization

The organization which is necessary, and the lay-out of a disinfesting station, are not easily dealt with in a brief paper. (See *Army Manual of Hygiene* or the book already quoted.)

As a minimum protection for sanitary personnel one suggests gum-boots; two complete sets of clothes should be available, one being reserved for work and put away in a closed box (e.g., metal dustbin) with a handful of flake naphthalene, the vapour of which kills lice. It might be necessary, particularly in the presence of an epidemic, to use a one-piece "louse-proof" garment of white washable material, reaching wrists and ankles and entered from the back.

REFERENCES

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Buxton, P. A. (1939). *The Louse*, Arnold, London.

M. Perrot (*Thèse de Paris*, 1940, No. 270), who records four cases in patients aged from 49 to 62, states that the low incidence of cancer of the body of the uterus (4 to 5% of all uterine cancers), its restriction for months and even years to the uterine cavity, and the relative scarcity of lymphatics in the body of the uterus explain the rarity of metastases secondary to cancer in this site. Bone metastases of cancer of the body of the uterus are most frequent in the bones of the pelvis and hip-joint. There has often been too great a tendency to attribute these metastases to radiotherapy, but in some of these cases the metastases were already present before this treatment began.

NUFFIELD PROVINCIAL HOSPITALS TRUST

A meeting of the Medical Advisory Council which has been appointed to assist the Nuffield Provincial Hospitals Trust on matters of medical policy and interest was held recently at Oxford under the chairmanship of Sir E. Farquhar Buzzard. Prof. R. M. F. Picken and Mr. H. S. Souttar were unanimously elected joint vice-chairmen of the Council.

Mr. W. HYDE, secretary to the Trust, stated that the work of the Regionalization Committee had already made substantial progress in spite of the difficulties created by the war. Regional and divisional councils had been formed in several areas and others were in process of formation. The response of local authorities had been most satisfactory; in several areas they were actively associating themselves with the councils which were being formed, and a number had announced their intention to make, through the councils, contributions to voluntary hospitals. It was the policy of the trustees to give grants to hospitals only through the regional councils, except in special circumstances. The income of the Trust was being used to assist in the organization of councils, to make grants to hospitals through these organizations, and to create a reserve for the difficult time which it was anticipated would follow during the post-war period. The chairman referred to the desire of the trustees for a general statement of policy in regard to co-ordination and development of hospital and medical services, but he suggested that such a statement would be difficult to draw up unless it contained illustrative examples of particular services.

It was agreed that subcommittees should be set up to formulate policies in relation to pathological, cancer, and accident services, and that memoranda prepared by these subcommittees should be incorporated in a general statement for submission to the trustees. Sir Farquhar Buzzard was authorized by the Council to invite the chairmen of Regional Medical Advisory Committees to attend meetings of the Central Medical Advisory Council when matters affecting their region or other matters in which they were specially interested were under discussion. The chairman mentioned that an interesting development of the scheme was this proposal to form Regional Medical Advisory Committees. One of these had been appointed in the Berks, Bucks, and Oxon Region under the chairmanship of Prof. G. E. Gask.

HEALTH AND NUTRITION IN NEW ZEALAND

New Zealand, with its population of just over 1,500,000 (including 80,000 Maoris), has had the lowest death rate and the lowest infant mortality rate in the British Empire. The Director-General of Health reports that for 1939 the death rate (excluding the Maoris) was 9.20 per 1,000 population, and the infant mortality rate, making the same exclusion, 31.14 per 1,000 live births. The birth rate was 18.73 per 1,000 of population, but the increasing percentage of first births to total births arouses some misgiving as indicating that the rising tendency of the birth rate is largely the result of the increased marriage rate during recent years, and does not mean that married people are having larger families. Heart disease in all forms is the principal cause of death, but cancer comes second, 1,815 deaths being assigned to this cause in 1939. The year was a quiet one in respect of infectious diseases, but the notifications of such diseases among the Maoris increased. The nutrition of the majority of the school children in New Zealand is regarded as satisfactory, though there are still even in this rich food country some evidences of subnormal nutrition. Maternal deaths attributed to pregnancy or childbirth, other than deaths from septic abortion, numbered 85, giving a death rate of 2.95 per 1,000 births, as compared with 2.80 for England and Wales in 1938. During the year 147 cases of puerperal sepsis following childbirth were notified. The number of deaths from puerperal sepsis has tended to rise during recent years. This is coincident with the extensive use of the sulphonamides; it is considered probable that the rise in the death rate, which was in excess of the rise in the incidence rate, may have been due to the wrongful use of these drugs, resulting in agranulocytosis. The Maori maternal mortality rate is considered separately, because a large number of Maori women are still delivered by native methods. Among these people this rate was 4.13, as compared with 5.41 the previous year. It is thought that now maternity benefits under the Social Security Act are available much better results may follow owing to the fact that the Maories will enter hospitals, the cost of which in the past was quite beyond their means. Reference is made to the working of the Social Security Act, under which maternity and hospital benefits have become available. During the first ten months of the Act maternity benefit payments were paid in respect of 24,506 patients, and payments to medical practitioners for 10,308 patients. Hospital benefits, which consist of payments from the social security fund for hospital treatment, were started on July 1, 1939, and during the first nine months claims totalling £514,000 have been received from hospital boards, representing an average of slightly more than 7,000 patients daily during that period in respect of free treatment. An appendix to the report deals with Maori diet. It is mentioned that before the "pakeha" (the white man) visited New Zealand Maori diet was eminently satisfactory. Proteins and fats came mainly from fish, fowl, and "occasionally human flesh in time of war." With the advent of the pakeha Western diet was introduced, and now fish is seldom caught, flesh foods are restricted, and potato, white flour, and baker's bread, sugar, cereals, maize, pork, and tinned meats and fish are the staple foodstuffs. The pakeha has introduced his foodstuffs without inculcating knowledge of their correct proportional use.

HEALTH ON GIBRALTAR

The "Rock" which guards the western approach to the Mediterranean and is becoming of vital importance in the changing face of the war covers not much more than two square miles of territory, and on this it customarily bears a civil population of over 20,000 with health and housing problems of its own. A large proportion of the civil population, however, has now been evacuated; some few thousands remain, but the members of the garrison far outnumber them. There are very few women on Gibraltar now; the wives and families of the Service men have gone home, and the few Englishwomen who are to be seen are chiefly nursing sisters or women engaged in some occupation other than individual housekeeping. The report for 1939 of the medical officer of health for Gibraltar (Major R. A. Mansell) has just been received, and although it relates to conditions of population which have altered considerably since it was presented to the city council it has several points of interest. Among the civil population of Gibraltar last year the birth rate was 20 85 per 1,000, and the death rate 14.25, both figures rather larger than those obtaining for most English towns. The unfortunate figure, however, is for infant mortality, which last year was 79.36 for 1,000 births, and was the highest since 1928. It has been rising steadily during recent years in parallel with the gross overcrowding of the city. On the other hand, Gibraltar has remained remarkably free from epidemic disease, and this, in a population of over 20,000 in a seaport town which is also in direct land contact with a foreign country (Spain), is something of which any public health department might be proud. The number of cases of notifiable infective disease during the year was only 93, the lowest for half a century, and more than one-third of these were cases of chicken-pox. The number of deaths from pulmonary tuberculosis was ten, and the medical officer expresses some disquiet concerning the prevalence of this condition. He also writes strongly, in what is his farewell report, on housing in Gibraltar. A report on housing was published in 1937, and in the same year its recommendations were accepted by the British Government. But the matter tarried, and shortly after the outbreak of the war it was declared that the housing scheme must remain in abeyance until after the war. The medical officer mentions instances of a man, wife, and three children living in one room, some fourteen feet square, on a wage of less than thirty shillings a week, paying five shillings for rent, and without provision for sickness, unemployment, or old age, while the cost of living is not very much less than that obtaining in England. It is evident that in the post-war reconstruction this fortress colony will require—as it will also deserve—consideration and help. In the meantime it is to the credit of the medical officer and his small staff that the health record, taking all things into account, is so good.

Reports of Societies

PATHOLOGY AND MEDICINE

Presidential Address to Medical Society of London

Dr. G. W. GOODHART was installed as president of the Medical Society of London on October 14 and proceeded to give his presidential address entitled "Stray Thoughts on Pathology and Medicine."

A very desirable change (said Dr. Goodhart) had taken place during recent years in the teaching of pathology to medical students—a change which he could best describe by contrast. When he first entered the hospital wards there were two chairs of pathology in London, both of which were held by physicians, and at his own school there was no chair. To-day in the schools attached to the University of London there were between twenty and thirty chairs in pathology and allied subjects. Nowadays when a pathologist was mentioned one thought at once of a man working in a laboratory, and the last place in which one would look for him would be the wards of a hospital. A correspondent in the medical press had stated recently that pathologists were like dictators: they dealt with human material but their contact with human beings was less than that of the local dustman. The criticism held some truth in that pathologists were being created who knew very little of clinical medicine.

The Science of Pathology

The science of pathology received impetus from the easier isolation of bacteria. Many problems which had no immediate relation to practical medicine were investigated, and it had come to be realized that pathology must be studied for its own sake. No one realized this, said Dr. Goodhart, more fully than himself, but unfortunately some pathologists in their struggle to obtain a status for pathology went further and said that it must be studied for its own sake alone, and that to be a good pathologist one must cast away any idea that one's work might be of any value to clinical medicine. His own view was that pathologists of that kind should find their opportunities in other spheres than medical schools or teaching hospitals. At the same time as academic pathology was raising its head therapeutic procedures such as vaccine treatment were introduced, demanding a technique to be found only among laboratory workers.

Those who followed clinical practice were faced with a position of considerable difficulty. Some studied bacteriology and became experts in that subject; others struck out in new ways based on physiology, but many pathologists failed to appreciate that their predecessors got their knowledge by diligent work and patient observation. How to obtain clinical experience was a problem which called for genius to solve, and, moreover, a problem which became more difficult with further advances in bacteriological technique. The increase in the mass of laboratory work was part of the post-war demand for reconstruction and research, but the idea found currency that research was necessarily something done in a laboratory, whereas research could be done in any place—ward, operating theatre, library; even in several places at once.

The Laboratory and Research

It was this association of the laboratory with research which widened the gulf already separating the practice of medicine from the laboratory. After a good deal of discussion teaching units were formed, the function of which was laid down in a memorandum by Sir George Newman, where it was postulated as essential that some of the teaching in the schools should be in the hands of those engaged in research and that the posts should be whole-time ones. Thus research laboratories with a whole-time staff came to be regarded as necessary to successful teaching. These units had made a great contribution to progress, though not the expected contribution. In some of them teaching was the main activity, in others research, and very often the definite statement was forthcoming, "If we are to succeed we must be relieved from teaching." On the top of the units another department of medicine had been developed called "clinical science," and thus medicine was divided up into pigeon-holes when what was wanted was not division but unification. Such unification was not attainable so long as the idea persisted that pathology was not the province of the clinician. The idea must be recovered that pathology was the very foundation of the clinician's house.

What was the meaning of the word "clinical"? Clinical observation was made at the beside, and "clinical" was thus used merely as an adjective of place. Clinical investigation was contrasted with laboratory investigation. To use the term "clinical" in that way was not only meaningless but misleading. Many of the usual tests carried out in the laboratory could be done at the bedside, but to do them in the laboratory was more convenient. The information furnished by the laboratory was sought in order to obtain some definite fact about a particular patient in order to treat him rightly. These reflections invited the further question: What is clinical medicine? All those engaged in the practice of medicine were driven by two distinct impulses: to do all they could in the interests of their patients, and to probe into the secrets of Nature, meaning life and disease. He was impatient at any attempt to separate the art and science of medicine. It was possible for some people to engage in the science of medicine and pay little heed to the art, but he could not conceive any intelligent person engaging in the art of medicine without being brought to its science. He refused to subscribe to some of these subdivisions. He divided people into groups according as to which impulse dominated them. One group were clinicians, the other academicians, and for him there was no question of superiority of one over the other, except that when he was sick he wanted the cleverest doctor he could find, and he sought him among the "artists."

The Scientific Method in Clinical Medicine

Clinical medicine must itself be a pathology. To it was brought all the knowledge that academic study had made available, and an endeavour was made to get as clear a picture as possible of the disease processes. In the practice of clinical medicine they adhered to scientific method, collecting facts with accuracy, arranging them in orderly fashion, and making logical deductions. The data collected might be insufficient to enable conclusions to be drawn, but if this were recognized they could content themselves with probability rather than certainty and hope that experience and judgment would in time bridge the gap. He objected only to the name "clinical science," which Sir Thomas Lewis had given to one branch of medicine. It conveyed the suggestion that ordinary clinical medicine was not science. He never understood why Sir Thomas Lewis had not chosen the good old name "pathology." Both clinical and academic medicine must be regarded as using in an equal degree the methods of scientific inquiry, and both should be equally concerned with research.

Except in the case of a few, Dr. Goodhart said in conclusion, it was impossible for the modern clinician to master all the science he wished to call to his aid, and the laboratory worker would go far to supply the need—he said "laboratory worker," not "laboratory," for there was a vast difference. Specimens should be sent to the pathologist with all the available facts so that he could do his best to throw light upon the pathological process. But this was never the same in any two people; it was always the result of many factors, and the pathological finding would vary with those factors. If co-operation could be secured between the clinician and the laboratory worker the desired unity between medicine and pathology would be ensured. He added that it was the glory of the Medical Society of London that it had never permitted any separation between the integral parts of medicine. Changes more radical than any hitherto seen might come about, but one fundamental article of faith should remain—namely, the indissoluble union of medicine and pathology.

The forty-eight States, four Territories, and the District of Columbia, U.S.A., have been allotted $5,672,388 in Federal funds to aid in controlling syphilis and gonorrhoea during the coming year.

Local News

ENGLAND AND WALES

The L.C.C. Domiciliary Midwifery Service

After negotiations with the London Maternity Services Joint Committee, which is the representative body of the voluntary organizations employing domiciliary midwives, the London County Council proposes to increase the payments made to voluntary hospitals and to district nursing associations for confinements. The payments at present are: to voluntary hospitals, £2 6s. 10d. for each confinement attended by a midwife acting alone or when a medical student is present, and £1 17s. 6d. for each confinement attended by a midwife accompanied by a pupil midwife; to district nursing associations, £2 14s. for each confinement attended by a midwife. The revised payments are to be £3 5s. for each confinement attended on behalf of a voluntary hospital by a midwife alone or with a medical student, and £3 12s. 6d. for each confinement attended by a midwife in the employ of a district nursing association. Since the payment of £1 17s. 6d. was fixed for confinements attended by a midwife with a pupil midwife revised rules have been approved by the Central Midwives Board for the training of pupil midwives, and these have resulted in a loss of income to the training hospitals. It is considered, therefore, that the payment authorized for confinements attended by a midwife only should be granted in respect of confinements attended by a midwife with a pupil. The fees fixed for the attendance of a midwife employed by the Council or a midwife employed by a voluntary organization are £2 for a first confinement, £1 10s. for each subsequent confinement, and £1 10s. for the attendance of a maternity nurse. Because of the increased cost of the domiciliary midwifery service it is proposed that these fees should be raised to £2 10s. for first confinements and to £2 for subsequent confinements and for maternity nursing cases. The assessment rules, which ensure that a patient who is unable to afford the full fee is not asked to pay more than she can afford, will continue to operate. The Council provides a free sterile outfit for domiciliary confinements undertaken by its own midwives, and many of the voluntary hospitals already provide free outfits. The district nursing associations usually arrange for the patient to obtain the outfit from the appropriate metropolitan borough council, which generally makes a charge for it conformable with the patient's financial circumstances. It is proposed that the voluntary hospitals shall be required to provide a satisfactory sterile maternity outfit free of charge to the patient, but in the case of district nursing associations the outfit will be provided by the Council free of charge. This arrangement will facilitate both freedom of choice of midwife by the patient and interchange of patients between midwives employed by the Council and the associations.

INDIA

Medical Women's Service in India

The annual report of the Countess of Dufferin's Fund for supplying medical aid by women to the women of India states that two new Dufferin hospitals have been opened during the year—at Calcutta and at Amraoti in the Central Provinces. The Lady Hardinge Medical College, New Delhi, reported 137 women students on the college rolls and the laboratories in full occupation. At the college hospital there were 5,000 in-patients and 67,500 out-patients during 1939. Reports are given concerning the work of medical relief to women in the Punjab, where, during three years, the number of women's sections of hospitals and women's dispensaries has grown from 52 to 68, and the number of women assistant and sub-assistant surgeons from 36 to 62. In ten medical colleges in India (exclusive of Burma) there were 570 Indian and 48 non-Indian women medical students taking the university course for the M.B., B.S., and in these colleges and in the schools of medicine there were 740 Indian women students training as licentiates. At the twenty-six hospitals in areas directly under the Government of India or in Governors' Provinces under the local Dufferin Fund, all of them under officers of the Women's Medical Service, there were 2,219 beds and cots, and the staff of the women's service attached to these hospitals numbered 37, with 86 assistants, and 237 sisters and staff nurses and 413 probationers. In the 158 hospitals in the Indian States under the charge of women doctors there were over 4,000 beds. It is mentioned that the public still seem slow to realize the fact that medical relief according to modern Western methods is expensive, and that if they wish to obtain the services of highly qualified and experienced doctors such as Women's Medical Service officers and to take the treatment required they must be willing to contribute towards the expenses in proportion to their resources. Many middle- and better-class patients insist on occupying beds in general wards, though paying rooms are available, and at most give a small donation to the poor box on leaving, even after confinements and operations. Modern India, like other countries, needs to assimilate the fact that it can only afford free medical treatment to the real poor.

Correspondence

Large-scale X-ray Examinations

SIR,—Why should Dr. J. F. Brailsford (October 5, p. 471) be accused of seeking "subtly to undermine the position of those who advocate the extension of mass radiography for pulmonary tuberculosis" because he dares to show the dangers that go with such a system? I venture to say that instead of being "unfortunate," as Dr. P. D'Arcy Hart (October 19, p. 534) calls it, it is fortunate that radiological experts should candidly give their evidence in respect of any new system of radiological examination.

Lieut.-Colonel Eric L. Cooper, whose article (August 24, p. 245) was the origin of the present controversy, makes some extraordinary admissions as to the conditions under which the clinical examination of Australian recruits was conducted: "hurried examinations in a noisy drill hall"; acknowledged "disabilities under which the medical boards worked in the camps"; so that it is not surprising that men were passed as "Fit, Class I," in whom subsequently "*x*-ray examination showed extensive chronic tuberculosis with large cavities in both lungs" (!), or "*x*-ray examination revealed *extensive* areas of infiltration," and so on. Are we asked seriously to take this as an argument for the superiority of *x*-ray diagnosis of pulmonary tuberculosis over clinical diagnosis?

In many years of tuberculosis work I have been convinced that it is just as possible to be led astray by *x*-ray examination as by ordinary clinical examination in the diagnosis of early pulmonary tuberculosis. The wholesale diagnosis of "hilum tuberculosis" in children, so common some twenty years ago, on evidence now discredited by all intelligent radiologists, though still, alas! not completely scotched, constitutes perhaps the outstanding example. In doing temporary work in recent years I have been again and again struck by the number of cases in which the diagnosis rested only on *x*-ray reports, and in which, after perhaps some years, clinical evidence was still lacking, and a further *x*-ray examination showed no evidence of tubercles: and here I am not referring only to children. As Dr. Brailsford says: "Radiographs may show appearances indistinguishable from pulmonary tuberculosis at one period, and yet within a week or so radiographs may show that the suspicious shadows have disappeared."

Sir Henry Bashford has expressed what, to my mind, is the real crux of the matter in the concluding sentence of his letter (September 21, p. 395): "It is profoundly to be hoped . . . that the utmost care will first be taken to learn and assess what is in fact really prognostically significant in these *x*-ray findings; and to avoid unnecessary labelling . . . with possibly dire psychological consequences to themselves and their families, new hosts of young men and women as cases of

pulmonary tuberculosis." This aspect of the matter appears to have escaped the attention of Dr. D'Arcy Hart. If he will look back to the *British Medical Journal* of February 27 to May 8, 1926, he will find the question very thoroughly discussed in the correspondence columns under the heading "Common Sense in Relation to Doubtful Tuberculosis." I could give many examples of the cruel results of too facile a diagnosis of pulmonary tuberculosis, subsequently proved to be mistaken: inability to obtain an insurance policy; discharge by the employer with resulting chronic unemployment; refusal of the parish clergyman to allow participation at Holy Communion, etc. These results are seen by tuberculosis officers, and are perhaps not realized by others in the position of Dr. D'Arcy Hart.

I would emphasize the supreme importance of sputum examination, which is allowed, inexplicably, to take a very subordinate place in the records even of many tuberculosis officers. In the first case quoted above from Lieut.-Colonel Cooper's paper a simple sputum examination would have settled the question forthwith. What is required is the combination of clinical, bacteriological, and radiological evidence. Dr. D'Arcy Hart lays great stress on the statement that "those authorities who have introduced mass *x*-ray examinations are well satisfied with the results." I should question whether sufficient time has been allowed for attaining a definite conclusion, and I think that the opinion of the specialist tuberculosis authorities should be the deciding voice.

Finally, I should like to quote some concluding words of Lieut.-Colonel Cooper's article: "This paper must close upon a note of caution. There has been much criticism of the microradiographic method of diagnosis of tuberculosis. . . . It is not the opposition which is to be feared . . .; a greater danger is that of the too ardent advocate. . . . No one should be labelled tuberculous on the unsupported evidence of a 35-mm. film"; nor even, I would venture to add with great trepidation, on the unsupported evidence even of a full-size *x*-ray film in a case of doubtful very early tubercle.—I am, etc.,

Southborough, Tunbridge Wells, Oct. 20. E. WEATHERHEAD.

Arrested Tuberculosis and Military Service

SIR,—Dr. E. Weatherhead, in his interesting letter on the above subject (October 19, p. 534), gives two striking examples of what he terms "completely arrested" pulmonary tuberculosis in which—although two men were subjected, the one to four years' strenuous military campaigning and the other to the prodigious labour of man-hauling a sledge in the Antarctic—neither suffered any reactivation of the pulmonary tuberculosis from which he had previously suffered. These examples are not unique. In his autobiography a distinguished Dublin physician, whose children's clinics I have been fortunate enough to attend, states that in 1925 he was suffering from a tuberculous pleural effusion. However, 1933 found him among Ireland's forwards at Twickenham, on a day when sheer brilliance of forward play enabled Ireland, six points behind at half-time, to fight back and hold England to a draw.

I have none of Dr. Weatherhead's great experience as a tuberculosis officer, but should not these cases, and others which may resemble them, be regarded as exceptional? When a case of pulmonary tuberculosis is classified as "arrested," is it not usual to make the reservation, consciously or subconsciously, that the man's condition will continue to be arrested so long as he can avoid excessive overwork or severe privation?

A surgeon lays down a strict post-operative regime because he knows that, although a few men could disobey most of his instructions and still make a recovery, restrictions are essential for the majority of his cases. I see a parallel between post-operative treatment and the after-treatment of pulmonary tuberculosis. A few patients with arrested disease may be fit enough for any form of activity, however severe—these are Dr. Weatherhead's "completely arrested" cases. But the majority of arrested cases I believe to be safe only so long as they keep their activities within the limits of an ordinary life.

There can be no means of knowing beforehand whether an apparently arrested case of pulmonary tuberculosis could stand a winter such as the last on the Western Front, or the rigours of the retreat to Dunkirk, without suffering a reactivation of his old lesions. Is it not safest, therefore, to declare quite simply that men who have suffered from pulmonary tuberculosis are unfit for military service? Under the new tuberculosis regulations, I understand that medical boards are to be made acquainted with the histories of known cases of pulmonary tuberculosis when these men come up for examination. In my view the simplest and the most satisfactory way of dealing with these men would be to certify them all as unfit for military service.—I am, etc.,

Barrowmore Sanatorium, Oct. 23. JOHN ASPIN.

Rehabilitation, Massage, and Passive Movement

SIR,—It is most unfortunate that an otherwise excellent editorial on this subject (October 12, p. 493) should include a grave misstatement. You write: "It may be said conveniently and correctly that there are often three stages in the treatment of an injury. First comes the active surgical treatment with some period of rest or immobilization immediately after; then a stage in which massage and passive movement are the chief remedial features; lastly the stage of active exercise and graduated work."

Such a view is a complete contradiction of the principles of modern fracture treatment. It represents a survival of the obsolete practice of immobilizing injured bones, and then after several weeks or months discovering for the first time that joints have become stiff. If the task of rehabilitation centres is to cure stiffness which should never have arisen it is unlikely that they will be any more successful than the old massage departments. There are no such stages of treatment. Active exercise and rehabilitation must begin on the day that active surgical treatment begins—that is, on the first day. Some joints may need to be immobilized, but every other joint is actively exercised, and functional activity is thereby maintained even in the immobilized region.

The most pernicious phrase of the sentence is that which refers to passive movement as the chief remedial feature. Passive movement and passive stretching should never be employed at any stage of the treatment of bone and joint injuries. It defeats its own object. Far from increasing the movement of a joint, it causes progressive stiffening. Hugh Owen Thomas spent his life in teaching this. Sir Robert Jones spent his life teaching it. Every member of the British Orthopaedic Association Fracture Committee is now teaching it. It is regrettable, when three generations of surgeons have attacked this dangerous practice, that by a slip of the pen a *British Medical Journal* editorial should advocate it.—We are, etc.,

T. P. MCMURRAY, Liverpool.
E. P. BROCKMAN, London.
R. WATSON-JONES, Liverpool.
H. O. CLARKE, Manchester.
W. P. GISSANE, London.
C. G. IRWIN, Newcastle.
E. LLOYD, London.
K. H. PRIDIE, Bristol.
R. I. STIRLING, Edinburgh.

President and Secretary of British Orthopaedic Association, and Chairman and Members of the Standing Committee on Fractures.

Shelter Safety

SIR,—I spend most nights of the week either in public shelters (of surface or trench varieties) in East London or on duty with a mobile unit. I have therefore had experience of shelters both as a tenant and as a first-aid worker, and I was pleased to see Dr. E. Cronin's letter (October 19, p. 537) and to read (October 26, p. 579) of the trenchant protests of Dr. H. B. Morgan and Dr. Edith Summerskill in the House of Commons on conditions in the shelters. After seven weeks of intensive air raids these conditions are a disgrace to sanitary science and the boasted influence of our profession.

As a tuberculosis officer I have also a particular interest in the special dangers for the tuberculous patient and the general public in contact with him in crowded shelters. The dangers were outlined by Dr. P. L. T. Bennett (October 12, p. 502), and were certainly not overstated, but I profoundly

disagree with his conclusions. I find a large number of patients anxious to be evacuated. I wonder if Dr. Bennett "stays put" in Fulham at nights, or, if so, whether he has experienced the same sort of aerial warfare as in my part of London. I doubt if the censor would pass details of local damage, but I should be very pleased to show Dr. Bennett a few thickly populated areas affected, and I am sure he would then agree with me that since the use of mines and bombs of heavy calibre it is not a question of a "more or less remote danger of a direct hit" upon a single house.

A point of view similar to Dr. Bennett's appears to be held by the Standing Advisory Committee on Tuberculosis. On September 19 I wrote to the N.A.P.T. urging them to use their influence with the Government to secure large-scale evacuation of tuberculous patients to special homes or hospitals in the country. My letter was referred to the Standing Advisory Committee, from whom I have received a reply dated October 17. This states that they have decided to recommend to the Ministries of Health and Home Security that (1) so far as possible each tuberculous family should have a family shelter and should obtain priority in the issue of an Anderson shelter or other assisted shelter accommodation; and (2) where tuberculous families are moved or rehoused, so far as possible they should be given accommodation apart from other families.

I have spent several nights in Anderson shelters, and, quite apart from their limited safety value, their musty damp atmosphere in autumn weather is conducive to coughing and colds. Rain-water seeps and sometimes pours through the sides and collects on the floors, even when it does not stream directly in through the front. We spend much effort in normal times trying to persuade patients to sleep in separate rooms, and the Advisory Committee suggests that we should crowd the whole family, sputum-positive patients included, into an Anderson shelter or similar space for twelve hours a night. Well, it limits the danger to a few thousand round half-dozens instead of to the general public, and may settle some questions about resistance to mass infection—to our disadvantage. I would gladly find Anderson shelter accommodation for any six (or even four) of the Standing Advisory Committee on a wet night, and much as I should like to include a tuberculous patient to complete the experience I would spare them that discomfort if they would accept the simpler offer.

From the purely practical point of view, in districts where raids have been heavy (now a large part of London) you will not dissuade the average person, and particularly the often highly sensitive tuberculous patient, from seeking the best security he can find, and the sooner we realize it the better.

But why should we deny to people, tuberculous or not, the safety which could rapidly be obtained for all at an estimated cost of three weeks of warfare by the following measures: (*a*) large-scale evacuation of tuberculous and other ailing persons; (*b*) commandeering of existing buildings with deep basement floors capable of conversion into shelters; (*c*) the employment of unemployed miners and other suitable workers on the construction of other practicable deep shelters by tunnelling into hillsides and from tubes, etc.; (*d*) the construction of relatively safe shelters of the Haldane type capable of resisting bombs of a quarter of a ton?

The people of Spain, faced with difficulties far greater than ours, built deep shelters in wartime during constant raids and saved thousands of lives and other casualties. Why don't we? The Government has assured us that it has taken powers to override all private interests in case of need. I suggest that it should start with the cement ring which has held up the production of cement.

Finally, our responsibility as a profession is a serious one and our influence as a body open to grave challenge. Time and again when seeking a dry spot to put my blankets on the narrow benches of a trench shelter I have been asked, "When are you doctors going to tackle these conditions and look after the people's health?" I assure you that there are growing numbers of doctors who are restive about the failure of our own people "up top" to realize some of the social conditions of the people, and who are suggesting that some broad movement of practitioners in touch with the people's needs should be formed to deal with these things.—I am, etc.,

London, E., Oct. 25. C. K. CULLEN.

The Problem of the Shelters

SIR,—Dr. E. Cronin's letter on the shelter problem (October 19, p. 537) interested me greatly, for I am sure we should recognize and rectify our mistakes about shelters. While agreeing with much that he says, there are one or two points that I think should be commented on, and I can do so from my personal experience as a warden.

Surface shelters in my part of London have certainly (to my own surprise) stood up to blast and falling masonry very well. I could take Dr. Cronin to see one which must have got the full force of the blast of a very near bomb; it is only cracked and has a few bricks loosened in one corner. The adjacent shelters are not damaged at all. Many of the surface shelters are, as he says, wet inside; these have been badly placed and not drained. There are others perfectly dry. I could take Dr. Cronin to some used nightly by families, who have made them comfortable with stoves, curtains, and easy chairs, and who prefer them to the fetid atmosphere and insect life to be found in tubes and large deep shelters in the working-class neighbourhood where I work. I agree that the noise is a menace to sleep, but these working-class people *do* sleep somehow.

However, on the whole, surface shelters are more suitable for day raids, and in congested market streets the more timid and the more cautious dodge into them when guns blaze away in the daytime. I would also add that at any time they are adequate protection against shell splinters, and police and wardens step thankfully into them when they patrol the little streets amid a perfect storm of splinter, coping-stone, and chimney-pot fragments. Surface shelters have their uses.

Passing to another point, I believe women in London have *their* uses! I agree that children, and mothers for the most part, and invalids, should be sent to safer places, but I wonder what would become of the army of civil defence workers if there were no women to wash and mend and shop and work and clean and cheer the men and women in the defence services? Dr. Cronin should remember that we have not the advantages of the Forces; we do not live in barracks and have our meals all ready for us; some of us would dislike it if we did. We are living a normal civilian life when off duty; we are still civilians, only with no time or energy left to do every civilian job for ourselves. I submit to Dr. Cronin for his careful consideration the suggestion that the morale and the health of the civil defence would deteriorate rapidly without the women of London. How unspeakably grim would be a London population completely in uniform; how many of us would care to risk our lives daily and nightly for the mere buildings? We do it that life shall go on so far as possible in a normal manner in the London which is the centre of everything. Industry must go on, homes must be guarded, and communications held. The women of London are helping to carry on, uniformed or ununiformed.

I wonder if Dr. Cronin and all the doctors could get some constructive thinking done on the subject of health in shelters. We are all aware, medical and lay alike, that infection is spreading, and that in the early spring months it cannot help but prove as great a menace as the bombs. Supposing we get a case of infantile paralysis in one of our huge shelters unrecognized. Parents *do* visit children in places as near as the village with the recently notified case in Bucks. How can wardens and shelter marshals be expected to discover infectious diseases in shelters? They have not the necessary knowledge or the authority to go round inspecting people's throats and pulses. I do know that measles and scarlet fever have crept into shelters in my district before any of us knew. The sanitary conditions of shelters generally leave much to be desired. That is not because borough councils are bodies of evil men; they are not evil, they are just ignorant. They have a vague idea of the need for lavatories, and that is as far as their knowledge goes. It is no good saying: "There is the medical officer." There is, but has he an adequate staff? How does his pre-war job compare with the great problems now before him, and are his years any less and his faculties any keener; and where are all the school doctors and nurses he used to have? Could not Dr. Cronin and others who know (so much better than the

butchers and builders and clerks who compose the councillors and aldermen) the value of ventilation and warmth, cleanliness and sleep, and clean drinking water—could not they think out some workable plan for getting these things in shelters? This is not a time for criticizing other people's efforts unless you are going to think of something better and go in and help them.

I myself could give the doctors a few ideas, because I *have* thought about the shelter problem, but I will not do so unless asked, because I know they have so much more knowledge than I have, and can work it out into some plan that has relation to the difficulties and facilities of putting into practice. The need is urgent and will become more so.—I am, etc.,

R. C. SEDERGREEN,
London, Oct. 21. Warden.

Evacuee's Sore Throat and Shelter Tonsillitis

SIR,—In devising new names for old diseases Mr. T. B. Layton (October 19, p. 531) exercises his undoubted authority, but when he revives a fallacy and advocates semi-dictatorial measures to enforce his views this cannot pass unchallenged. Cases undergoing tonsil dissection do equally well at all seasons of the year. In point of fact the only time in which climatic conditions may cause anxiety is on those all too rare occasions when we are visited by a heat wave, and this falls within the period when Mr. Layton would have us crowding the wards with cases which should have been dealt with months before.

On a small issue, Mr. Layton is simply indulging in the national habit of procrastination followed by feverish activity.—I am, etc.,

Hove, Oct. 22. T. S. ALLEN.

SIR,—It is surely an undesirable innovation that a contributor of the eminence of Mr. T. B. Layton should try to force by administrative action the adoption of a policy which has failed to commend itself to the great majority of the profession. It also seems a novelty that what would ordinarily be considered a controversial letter has been elevated to the status of an article in the *Journal* with a non-committal title. In the circumstances his solicitude about the "one-idea clinician" seems strangely out of place. I believe it is a slur on the profession to imply, as he does, that doctors in these days recommend tonsillectomy just because a child's tonsils are enlarged. It is equally incorrect to suggest that the enlargement of evacuees' tonsils is a result of their change from town to country life, for I personally examined a large number of Liverpool evacuees on their arrival in this district, and I never saw such a collection of enlarged tonsils in any group of children. My partner's experience was the same.

Tonsillectomy is frequently performed as much for a general as for a local condition, and actually a general practitioner who has carefully watched many children before, during, and for years after tonsillectomy is in a better position than any specialist to decide in most cases whether and when an operation is advisable. We are all grateful for instruction, but a policy which among other things is supported by "the great majority of the population," "hailed with enthusiasm by medical-minded laymen and laywomen," and buttressed by one case of otitis media, seems more calculated to impress the said general public than doctors who have been taught to observe for themselves and draw valid conclusions. In fact the whole tone of Mr. Layton's letter conveys the impression, forced upon him apparently by the mistakes which he so courageously admits, that in this matter uninformed opinion is at least as good as that of the experts. He is quite entitled to this view, but not to foist it upon doctors, administrators, and others as that of the profession at large.—I am, etc.,

Winsford, Cheshire, Oct. 22. W. N. LEAK.

Gauze Masks in Prophylaxis against Influenza

SIR,—The *Times* of October 21 published a letter from Dr. T. H. Sanderson-Wells which deserves the closest attention of our profession; he appeals for the universal wearing of gauze theatre masks by all persons who may suspect themselves of sickening for, or of having, colds or influenza in air-raid shelters and other confined spaces. He supports his plea by a striking illustration from his own hospital in the 1918–19 epidemic. Those who have experience of this method of prophylaxis will, I think, agree both upon its difficulty and its effectiveness.

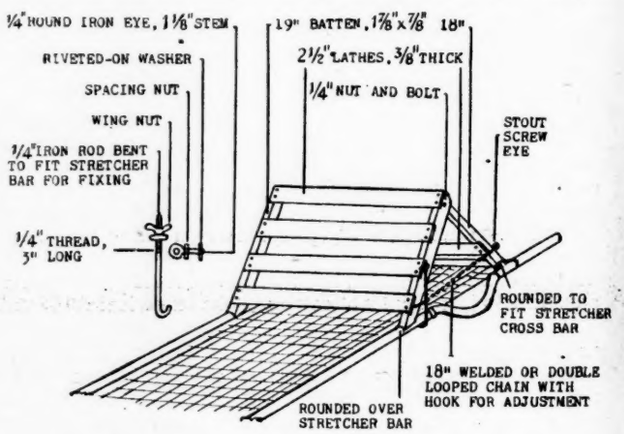
To get lay people to understand the nature of droplet and air-borne infection, and not to lapse for the fatal moment in their wearing of masks, is as difficult as it would be advantageous; but we may be faced with enemies to our public health and war effort far more devastating and deadly than bombs, and it would surely be a magnificent effort if the great weight of influence of our profession were thrown into organizing and carrying out such a measure of public health.

I would suggest that a small committee should be immediately appointed by the B.M.A. to consider the practical application of Dr. Sanderson-Wells's suggestion. It might well prove our greatest contribution at the present time.—I am, etc.,

Wembley, Oct. 22. H. M. HARRIS, M.R.C.S., L.R.C.P.

An Inexpensive Stretcher Back Rest

SIR,—Here is an illustration of a light, rigid support for a Fowler position for use on a stretcher. It has the advantages of being inexpensive, easily made, and ready for use, while the angle of rest may be varied according to need. With this a small bolster, the width of the stretcher, and covered with


¼" ROUND IRON EYE, 1⅛" STEM
RIVETED-ON WASHER
SPACING NUT
WING NUT
¼" IRON ROD BENT TO FIT STRETCHER BAR FOR FIXING
¼" THREAD, 3" LONG
19" BATTEN, 1⅞" x ⅞" 18"
2½" LATHES, ⅜" THICK
¼" NUT AND BOLT
STOUT SCREW EYE
ROUNDED TO FIT STRETCHER CROSS BAR
18" WELDED OR DOUBLE LOOPED CHAIN WITH HOOK FOR ADJUSTMENT
ROUNDED OVER STRETCHER BAR

jaconet, with ring and bandage at each end for attachment to the stretcher, serves to support the knees. I am indebted to Mr. R. G. Stewart of our St. John unit for both designing and making this support.—I am, etc.,

HAROLD C. J. BALL, M.R.C.S., L.R.C.P.,
Oct. 14. Medical Officer, Mobile Unit, New Milton.

"Trench Foot" in Civilians

SIR,—During the last war "trench foot" was attributed to the combined effects of cold, wet, and long standing. Some light on its aetiology may be afforded by the occurrence during the last few weeks in London of a number of cases of a very similar syndrome. Commencing with swelling in the foot, it progresses up the leg. At first painless, it subsequently becomes painful, with red shiny skin and stiffness at the ankle-joint. In one case it proceeded to blistering of the skin in the ankle region.

In this recent group the condition has arisen in an environment where all three of the above-named factors were absent. A.R.P. personnel, who are more exposed to cold and wet, and who may be presumed to have spent a big proportion of the twenty-four hours on their feet, have failed so far to provide a single case in my experience. The one factor common to all these patients has been a history of spending the night hours in a sitting posture, either in the house or a shelter, without compensating rest in the horizontal position during the day.

In the present small series of cases the use of a deck chair, with its wooden bar pressing in or near the popliteal fossa, is more productive of the condition than an upholstered chair. Three patients presented the condition in one foot only, and

in these it was interesting to learn that, for various reasons, they sat or slept with the knees crossed, the leg which was usually uppermost being the one in which the condition developed.

The present series has occurred in the middle-aged, especially in mothers of families using Anderson shelters of inadequate size. Contrary to expectation, neither varicose veins nor cardiac lesions have been observed in greater frequency than one would expect in an average cross-section of the population of the same age. Possibly an Englishman's chivalry to the infirm may account for this apparent discrepancy if the pathology is purely one of capillary stasis. It would appear that the capillary walls in healthy lower extremities are incapable of maintaining their tone against the influence of gravity for an indefinite period if the natural assumption of the horizontal position is denied them.

Relief of the condition has been rapid in every case where shelter arrangements have been modified to allow of rest in the horizontal position without pressure behind the knee, combined with support by a crêpe bandage during the "standing hours" of the day. The chief prophylactic measure in meeting this condition should prove to be the provision of bunks in adequate numbers, but in the time interval which must elapse before this desideratum is achieved calcium therapy may prove of value.—I am, etc.,

BRYANT W. KNIGHT, M.B., B.S., D.C.H.

London, N.W., Oct. 19.

Musculo-spiral Paralysis

SIR,—From reports in the Press this form of paralysis has occurred in those sleeping on hard surfaces in shelters. For some time I was woken up with tingling in the hand of the side on which I was lying. At first I ascribed this to circulatory embarrassment; then noticed that the little finger escaped. I concluded that the median nerve was affected and that probably the musculo-spiral nerve had been compressed during sleep as it wound round the humerus. If the elbow is kept at right-angles to the body the arm cannot be compressed in this way. I have found that I also escape the tingling if the upper limb is kept straight and away from the body, with the forearm pronated. Some can sleep with their lower arm behind them, which should be the best position of all for avoiding this paresis.—I am, etc.,

Stroud, Oct. 21. H. W. HILLS.

Air Raids: Dealing with Casualties at an Incident

SIR,—I read with interest the views expressed by Dr. N. Mortimer Vallely (October 12, p. 498). I discussed this same problem with the local practitioners in my area, and although all of them were earmarked for some particular work in connexion with the Emergency Medical Services it was thought practicable for them to offer their services also for the purpose of attending a street incident. The time-lag between the actual incident and the casualties' reaching hospital and being ready for the services of the surgeon would provide for this. Actually all the practitioners volunteered for this service; a list of names and telephone numbers is posted in the control room, and the medical officer of health will decide the necessity for a call.

Several points were raised in connexion with this service, as follows:

(*a*) That steel helmets, respirators, and torches should be issued to these practitioners as soon as available.

(*b*) That transport should be provided to convey the practitioner to and from the incident.

(*c*) That morphine in appropriate doses and packings should be made available for use by the practitioners.

(*d*) That consideration should be given to the question of adequate compensation in the event of accident, injury, or death whilst practitioners were on duty of the nature referred to.

The question of training personnel in the use of morphine was raised by me some time ago with the appropriate authority, and the view taken was that it would be unwise to issue morphine to first-aid parties unless a qualified medical man was present to authorize the administration, that morphine in particular is not a substance to be used by lay people indiscriminately, and that the advantages to be gained by my suggestion were far outweighed by the tragedies that might well occur. In view of the possibility of obtaining the services of a qualified medical man at the scene of the incident I have not pursued this point further, but the other points quoted above still remain to be settled.—I am, etc.,

Keighley, Oct. 17. H. MAINWARING HOLT.

Radio for Bomb Fragments

SIR,—The exasperating difficulty of finding small metallic fragments in the tissues may be simplified by taking one's wireless set into the operating theatre and connecting an insulated probe to the aerial terminal. Touching a bomb fragment or piece of metal produces a loud and characteristic click or scratching noise in the loud speaker, easily distinguishable from bone fragments or non-metallic objects.

Here is the technique. Take any valve-operated wireless set to the patient, switch on, and open out the volume control. If a programme is heard, tune it out, leaving the set still in a sensitive condition so that a finger touching the aerial terminal gives an audible sound in the speaker. Connect a few feet of wire ending in an insulated probe to the aerial terminal or socket and the apparatus is complete. A diathermy bladder electrode and a piece of single flex make an efficient attachment, or a few inches of stout silver wire covered with valve tubing almost to the end makes an efficient substitute. In either case the wire and probe must be sterilized before use.

Now test out. Any piece of metal in contact with the human body should yield a loud click when the probe touches it and a scratching noise on further contact. Bone and soft tissues should give no audible reaction; if one is heard, damp the receiver down by reducing the volume control. As the noise heard is due to capacity changes in the aerial circuit of the set, touching your patient's A.R.P. badge or tie-pin will give no result, while a ring on his finger or a piece of bomb in his buttock yields a loud and distinct click, the noise in the speaker increasing with the size of the metallic object touched. It is necessary to make actual contact with the foreign body before the signal is obtained, so that accurate location is ensured and subsequent withdrawal should not be difficult. I hope that adoption of this simple device may save the surgeon and his victim many weary hours in the operating theatre after the radiologist has done his best. Lastly, the electrical currents involved are infinitesimal, and there is not the slightest risk of shock to the operator or his patient.—I am, etc.,

Victoria Infirmary, Deal, Oct. 27. JAMES S. HALL.

Repeated Administration of Pentothal

SIR,—The case referred to by Dr. R. M. Davies (October 5, p. 450) is of interest because it illustrates the divergence of opinion on this matter between the laboratory and the operating theatre. Laboratory research is emphatic in counselling the greatest caution in both prolonged and repeated administration of the quick-acting barbiturates, yet those practising these forms of administration in everyday surgery seem to enjoy a curious immunity from the disasters presaged by the laboratory.

The two points of view are presented in glaring antithesis in two articles which appeared last year in the October number of *Anesthesia and Analgesia*. In one of these Carraway of Birmingham, Alabama, adduces 3,810 consecutive cases of pentothal anaesthesia with abundant investigations disclosing no serious complications, though the agent was used for every age group and for all manner of major operations, thirteen of which lasted over two hours, and in one of which thirty administrations were made to the patient over a period of a year. In the other article Reynolds of New Orleans derives from many laboratory experiments the conclusions that the dangers of cumulation are serious, that the heart is liable to sudden failure, that focal necrosis in the liver is frequent, and that there are no warning signs premonitory of these catastrophes. Elsewhere (Dallemagne, *Liége méd.*, 1938, **31**, 197) in laboratory experiments dramatic anaemic conditions, with precarious falls of oxygen capacity, have been recorded after successive administrations of evipan.

Only further investigation into the facts of surgical practice rather than laboratory conditions by many independent observers is likely to explain the discrepancy for the comfort of the anaesthetist. It is therefore to be regretted that information is not available in Dr. Davies's and other like cases as to the functional capacity of the heart, liver, and kidneys, and also the state of the blood picture before and after the administration of the quick-acting barbiturate. In the absence of such precise information it seems that anaesthetists must still suffer qualms in making the fullest use of these drugs, and yet doubt the real validity of their qualms.—I am, etc.,

Birkenhead, Oct. 8. R. L. WYNNE.

Sulphur and Sulphapyridine

SIR,—I was interested in Lieut.-Colonel R. W. Cushing's article on cerebrospinal fever (October 5, p. 439). I entirely agree with most of his findings, but I must take exception to his statement that during administration of sulphapyridine "eggs are dangerous, as are other foods of a high sulphur content." Is there any scientific foundation for this statement? The cyanosis has been attributed to sulphaemoglobinaemia, but has this ever been proved? Is the cyanosis due to deficient oxygenation of the blood, possibly owing to some chemical or physical effect on the envelope of the blood corpuscles, if not on haemoglobin itself?

Vitamin C appears to have a helpful effect in these cases of cyanosis. Intravenous injection of "redoxon" caused a remarkable improvement in one patient, but I have had as yet no opportunity to confirm this with certainty.

Eggs are a most valuable invalid food. We have given them freely at this hospital during extreme dosage of sulphapyridine with no ill effects whatever. Our mortality in the series of forty-eight cases reported in *Public Health* for September was 4.2%, appreciably higher than Dr. Cushing's excellent rate of 2.9%. We used sulphapyridine soluble and observed the same disadvantages. We also used serum. I think this has an effect, not possessed by chemotherapy, of reducing the effects of the toxaemia, and may have contributed to the rapid recovery of the patients. The average stay in hospital (deaths excluded) was twenty days.

I shall be interested to hear of any confirmation of the vitamin C treatment.—I am, etc.,

The Isolation Hospital, South Petherton, Somerset, Oct. 12. D. V. HAGUE, M.B., D.P.H.

Cause of Appendicitis

SIR,—Dr. Josiah Oldfield's theory that appendicitis is due to meat-eating (October 12, p. 505) does nothing to explain its "epidemicity" during the last half-century. The well-to-do among our great-grandfathers were enormous meat-eaters, but there is no evidence that they were particularly prone to the disease under any name. Moreover, our Australian and New Zealand cousins have always eaten about twice as much meat as we do, but are no more prone to appendicitis. For the last fifty years appendicitis has exacted a heavy toll of life, suffering, and material on our population, and the levy (though somewhat modified by therapeutic progress) still continues. Is it not a blot on our profession that no organized effort has yet been initiated to prevent it by a scientific investigation of the causation? The cynic would say it would not pay us to investigate. Must we leave it to the Germans when they can find time for it? Such an investigation would require well-organized team work, though independent observers could make valuable contributions. Historical, ethnological, sociological, physiological, pathological, and clinical evidence should be collected, carefully checked, and collated by a competent body, and the result would almost certainly throw a good deal of light not only on appendicitis but also on many other obscure digestive and "nervous" disorders. Why should not the B.M.A. "go to it"?

Many years ago I propounded what, for brevity's sake, I will call "my" theory, and offered some evidences (which, of course, needed and still need careful checking) under each of the six headings, and these, however shaky they may be, afford a reasonable jumping-off ground for an investigation, since they all tend in the same direction. Scepticism about the theory leaves us where we are; a serious attempt to disprove it would probably take us a long way forward. While it is not scientific to accept without full investigation a simple and obvious explanation, it is no whit more scientific to turn it down on account of its simplicity and obviousness. "My" theory is both obvious and simple and therefore apparently not worth investigating!

To paraphrase Dr. Oldfield, I fully agree with him that millions of mothers have averted attacks of appendicitis by the timely administration of doses of castor-oil.—I am, etc.,

Ambleside, Oct. 15. J. PRICE WILLIAMS.

Respirators into Oxygen Apparatus

SIR,—Major H. L. Marriott's very interesting and useful description (October 19, p. 519) of his adaptation of a civilian gas-filtering respirator for use as an oxygen face-piece inhaler prompts me to record certain improvements effected after further experience in the technique of converting and using as an oxygen tent an infant gas protective helmet. The original apparatus was described in the *Journal* of December 30, 1939 (p. 1279), but after repeated use it was observed that patients became uncomfortably hot during a prolonged stay inside the tent and certain modifications were made in the set-up.

A half-inch metal tap (the type with disk base used by gas fitters proved satisfactory and cheap) was fitted with adhesive strapping into the air-tight cloth top of the helmet to act as an outlet for exhaled air. The helmet tent fitted and used in this way on patients sitting up in bed was borne comfortably and with therapeutic advantage for comparatively long periods. A stream of oxygen enters the tent after being cooled by passing through a wide-necked, corked thermos flask nearly filled with ice. The cold inflowing oxygen, being heavier than the warm expired air, tends to keep to the lower part of the tent around the patient's face and mouth, dislodging upwards the warmer expired air, which leaves the tent by the open tap at the top.

An oxygen tent has certain important advantages over any type of face-piece inhaler. It can be used for infants as well as adults, and for patients with face or head wounds. It cannot be dislodged by bedclothes, nor is the restless or apprehensive patient tempted to pull it off. A patient can talk and even eat inside a tent, and an infant may cry comfortably within its walls. Moreover, the infant gas protective helmets provided by the Government are available in most households and institutions, and can be readily and cheaply adapted for oxygen therapy.

I consider that these advantages far outweigh the slight extra consumption of oxygen incurred by employing the tent method of administration.—I am, etc.,

Leeds, Oct. 24. W. HARTSTON, M.D.

National Dried Milk

SIR,—I am concerned, as no doubt others are, at the issue of the new national dried milk. Inquiry at the local food office informs me that it is a "full-cream dried milk of British manufacture by the roller process and containing approximately 26% fat." This is not sufficient data for its intelligent use. Does it contain, for instance, added vitamins? Nor am I happy about its keeping qualities in view of its scanty wrappings. A slip enclosed in the packet says it should be used under medical direction; yet so far as I know the profession have not been informed of its full composition. A full-cream milk is not suitable for all babies, especially under 3 months old; yet if mothers are to obtain dried milk free of cost they must perforce use this preparation.

Have paediatricians been consulted about its composition, or is it another example of authority's failure to utilize expert advice on the problem, now more vital than ever, of infant feeding?—I am, etc.,

Cardiff, Oct. 16. A. G. WATKINS, M.D.

*** National dried milk is a full-cream dried milk exactly of the nature of all such milks which have been on the market for many years. It is manufactured by the well-known makers of such milks, and it may be assumed that the medical profession is fully aware of its constitution. It does not contain added vitamins or added iron. The carton is of the same

nature as that which has been used in welfare centres for many years, but it is not wrapped in paper. The reason for this can be readily understood; but it is not sufficiently secure at the top and bottom to prevent accidents happening in transit from the place of delivery to the home. It is understood that some babies may require special types of dried milk—for instance, of the "humanized" type. These can still be obtained, as formerly, through the maternity and child welfare centres, or in the case of private patients by purchase in the open market. The Society of Medical Officers of Health has these and many other points under consideration, and is likely to make a pronouncement quite soon as to the views of the public health service on such questions as supplementation with vitamins, iron salts, etc.—ED., *B.M.J.*

Cream for Invalids

SIR,—I would be interested to hear what is the experience of medical practitioners in other areas with regard to the supply of cream to patients who require its addition to their diet. As I have several patients who do not tolerate other forms of fat but who benefit from cream, I ventured to approach the local food controller in their interests. His reply was to the effect that invalids were definitely not allowed a supply, but that any "requiring it specially could emulsify butter in one of the cheap emulsifiers on the market." How much cream per day the invalid was expected to derive from a weekly ration of two ounces of butter was not specified! To me it appears to be unnecessarily wasteful to churn cream into butter in order to re-emulsify it into cream.

Is this not a case in which the British Medical Association might approach the proper authorities, emphasizing the need of delicate individuals who require a readily assimilable form of fat, not to mention bottle-fed infants who have had it added to their diluted cow's milk? To purchase extra milk and skim it at home lands small households with an unusable quantity of skim milk.—I am, etc.,

Carnoustie, Oct. 21. H. F. WILSON.

Prognosis of Schizophrenia

SIR,—Your leading article on this subject (October 19, p. 526) emphasizes the bewildering position which arises from the application of the mass statistical method of evaluation without due regard to detailed clinical criteria. This implies the need for close individual observation of what may be termed psychiatric clinical signs (comparable with the observation of physical signs in general medicine) as opposed to the mere study of what happens numerically in large ready-labelled groups of cases, many of which have not been personally observed by those skilled mathematicians who tell us the exact proportions, probabilities, and so on of recovery, dementia, and death in connexion with them. In a great many instances we literally do not know what they are talking about.

At Bucks Mental Hospital in 1938–9 a small series of cases (thirty-five) was intensively observed and followed up in order to see whether there was any constant clinical sign which could be associated with any constant outcome in shock-treated cases. It was found that there was a parallelism amounting almost to specificity. The first group to be differentiated were those who did not recover with shock treatment. Without exception these cases showed a failure of abstract thinking (that is, an essential dementia affecting the highest levels first) which was readily detectable clinically, and in early cases often formed the patient's spontaneous leading complaint, just as an early aphasia will often complain that he cannot find his words. The name dys-symbole was given to this form of thinking failure, and its definition, clinical delineation, and value as a prognostic sign were published (*Proc. roy. Soc. Med.*, 1939, **32**, 843). This was, of course, only a very small beginning, but it seemed to point the way for future work, and has since been confirmed by Thomas (*J. ment. Sci.*, 1940, **86**, 100) and informally by some others.

Dys-symbolic cases conform closely to the "endogenous schizophrenia" delimited by Langfeldt (*Prognosis in Schizophrenia*, 1938) as a special group within the field of schizophrenia as a whole. It is evident that within this field are groups which are as essentially and qualitatively different from each other as are, for crude comparison, the different varieties of jaundice. A continued application of the mass statistical method to all the cases of schizophrenia will therefore get us nowhere. The almost universal acceptance of the Bleulerian delineation of schizophrenia as including all those cases which are not recognizably organic and not frankly manic depressive, together with the broad approach and almost pathological fear of a diagnostic label displayed by the Meyerian School, have served a valuable purpose in widening our conceptions. The danger now is that they and the statisticians will between them seduce us altogether from appreciation of the value of clinical observation and the attempt to classify cases according to their similarities. It has been fashionable for some time to refer disparagingly to such observations as "static," "descriptive," or "Kraepelinian." This is a great pity, for after all one concrete clinical sign is worth a dozen imponderable factors, and if your leading article stimulates a return to the closer clinical observation of cases it will have served an invaluable purpose, since there is no other part open to those who would see the wood under the trees in this vast forest which is at present called schizophrenia.—I am, etc.,

Bucks County Mental Hospital, Aylesbury, Oct. 21. IAN SKOTTOWE.

The Geniculate Body and Colour Vision

SIR,—I am grateful to Sir John Herbert Parsons for drawing attention (October 26, p. 574) to a statement in my letter which may be misleading. I should have added, at the end of my last sentence, "with ordinary illumination."—I am, etc.,

W. E. LE GROS CLARK.

Alien Doctors in Great Britain

SIR,—The letter printed below has just reached me from two doctors of German nationality who are now in this country. The writers have both been known to me for many years, and one of them I know intimately. Their letter is a spontaneous expression of opinion, and it represents the position of a group of doctors of alien origin all of whom carried out most of their medical training in this country and all of whom possess British medical qualifications.

"We are in touch with eighteen German doctors, but there are about twenty-five to thirty in all, who like ourselves are refugees from the Nazis, and who, having had their full course of medical training in this country, now possess British medical qualifications for medical practice.

"Most of us have been in this country for six or seven years, and had we pursued an occupation giving us earlier economic independence instead of following a prolonged course of study we should probably by the outbreak of war have been naturalized. Instead, in many of our cases we were told by the Home Office about three years after we had started our courses (and paid most of our fees) that we should not be allowed to establish ourselves in this country. However, most of us obtained permission to take resident hospital posts, and from the fact that we recommenced our studies in this country under added difficulties of language and financial outlay, it may be concluded that our interest in medicine goes further than a mere wish of establishing ourselves in practice.

"All those of us who were in house posts had to resign in May–June of this year following an Order from the Ministry of Health prohibiting employment of Austrians and Germans on the medical, nursing, and technical staffs of hospitals which have or might possibly take members of the Forces as patients. This precluded us from positions in practically all hospitals in this country.

"Our position at the moment is that some of those with whom we are not in direct personal touch are still interned; of our group of eighteen three have been released following internment, and the remainder escaped detention and are now being exempted from internment as falling under the categories of the Government White Paper. The fact of our release or exemption from internment shows that we are regarded as politically trustworthy and friendly aliens, and that the

authorities realize that we may be needed. In spite of this, the existing Orders preclude us from doing any useful work, and the financial position of many of us is becoming serious. Where, through the good will of individuals, we get a chance to work, this is prevented by a local authority, as in the case of one of us.

"In writing to you we have put our points more bluntly than we should have done in an official letter; but as you know both of us well, we felt there was no need to hide our disappointment and bitterness, which are justified, as we have repeatedly offered our services to this country, finally even in the Auxiliary Military Pioneer Corps. We feel, however, there should now be no difficulties in giving us a place in some form of medical service."

These men admittedly form a small but special group of alien doctors. They are all refugees from the Nazis, and they have all received their medical training in this country. Whether they have remained free or have been interned or are still interned, they are not in a position to resume their previous posts or to undertake new work. The Ministry of Health Order will not allow alien doctors to undertake hospital work which may bring them into contact with members of His Majesty's Forces. With the present ubiquity of the armed Forces, the fact that even the most unlikely hospital may contain members of the Forces at some time or other prevents hospital boards and local authorities from giving apointments to doctors of enemy origin.

In the coming winter months and with the present abnormal aggregations of people there is certain to be medical work for every doctor in the country, whether British or not. If the Home Office is satisfied about the political trustworthiness of alien doctors, then their services should be utilized, and they should not be allowed to remain in idleness, frustration, and penury.

Total war ignores national boundaries, and the present conflict is likely to be over the sooner if we are willing to recognize as allies all who will work for the causes of ordered government, freedom, and toleration. Race, creed, and colour hardly count.

If it is possible for us to accept the services of Prince von Starhemberg as a lieutenant in the Free French Air Force, and as an ally in the cause of democratic government and institutions, then it should not be a matter of too great difficulty for Departmental consciences to extend similar privileges to those alien doctors who are anti-Nazis, and especially to those who have received their training and qualifications in this country. If there are still objections to these doctors being employed for general purposes, then their services might be made available for looking after women and children either in hospitals or in the evacuation areas.—I am, etc.,

London, W.1, Oct. 28. REGINALD T. PAYNE.

Cut Fingers in Factory Workers

SIR,—In the past month or two there have come to me adults with lost flexion of fingers due to severance of tendons being overlooked when a small wound was inflicted at work. The natural explanation for the increased incidence in this kind of injury is the speeding up of industry. It is, however, disquieting that the deep damage goes unrecognized when the cut is dressed, for later suture is difficult and the sequel so often disappointing.

For the sake of the patient and the nation's need of efficient fingers, I ask your space to draw attention to a regrettable defect in factory first-aid posts. We must not expect a nurse to be alive to such hidden harm in a trivial cut. The remedy is that cut fingers should be reported to the doctor on the day of injury and for him to make such arrangements as will ensure prompt tendon suture, which is as easy as it is successful.—I am, etc.,

Bristol, Oct. 27. A. WILFRID ADAMS.

Doctors and Civilization

SIR,—Many of your readers will, I am sure, have been struck by two recent letters which appeared in successive numbers of the *Journal*—namely, those of October 12 and 19. One was from Dr. G. H. Alabaster (p. 507) and the other from Dr. E. Cronin (p. 537). Both these doctors write from London, and no doubt are more than impressed by recent experience. Dr. Alabaster indicates that the time has come—indeed is more than overdue—for our profession to make some specific contribution towards a solution of the present world crisis. Dr. Cronin actually suggests a definite contribution of this kind; it primarily concerns air-raid shelters, but obviously has much wider bearings. I presume that Dr. Cronin bases his suggestion on the fact that our profession's essential business is the preservation rather than the destruction of life, and that it is in accordance with this that he advocates, and would have the profession advocate, a policy of bomb-proof shelters for the populations of big cities and congested areas generally. If the old saying *Salus populi suprema lex* be true, then Dr. Cronin's advocacy is undoubtedly right. Why should any money be spared if the lives of the people are at stake?

And I would add that it is time that the medical profession, in its role as guardian of life, also turned its attention to the other danger that is now looming ahead for Europe—namely, that of famine. If these problems are to be left entirely to the politicians, then indeed civilization's days are numbered.—I am, etc.,

Helmsley, Yorkshire, Oct. 22. A. J. BROCK.

Our Unused Influence

SIR,—I have read Dr. George H. Alabaster's letter (October 12, p. 507) with great interest and sympathy, but are we here in Britain encouraged to follow his example? I think, no more now than in the last war. Owing to their activities in endeavouring to promote a peaceful understanding between nations certain British citizens have been imprisoned, although no evidence against their good faith and patriotism could be adduced. All those who (whether actual "pacifists" or not) were against the present war are looked on with suspicion and even regarded as "potential traitors" or "fifth columnists"—a proceeding which to my mind is not one likely to help to win the war, but rather the reverse.

This war, as most others, has much to do with jealousy, hatred, and greed, and I am sceptical of our profession's influence or power to discourage these vices. I am not even quite certain that our profession is much more free from such taints than most other professions. Surely, however, all learned professions might agree that, as individuals who are the greatest enemies have to live together in the same world without killing one another, so enemy countries might also live without entering on a struggle to the death. If they did so some measure of understanding might ultimately be reached, apart from occasional brutal retaliation "to make the other brute really feel." Humans are apparently still ahead of other animals in regard to the love and fear of retaliation. Politics, unless freed from hypocritical and lying propaganda and violence, will never cure the world, although violence may at times constitute a "necessary evil."—I am, etc.,

London, W.1, Oct. 19. F. PARKES WEBER.

Local authorities and authorities of approved centres for the treatment of venereal disease are asked, in a recent circular from the Ministry of Health, to provide out-patient continuation treatment and tests of cure for members of the Forces who may be referred for this purpose. Hitherto there were special arrangements for both out-patient and in-patient treatment of members of the Forces other than members of the women's auxiliary organizations. It is now thought that there will be economy in money, time, and staff by this new arrangement. Payment for this extended service will be made in the same way as for the treatment of venereal disease among Service out-patients at hospitals in the Emergency Hospital Scheme. Evidence is forthcoming that there has been some increase, fortunately not serious, in the incidence of the disease since the war began, and the circular urges the need, especially in areas where there are new industrial units or military stations, for extending the treatment facilities. A grant of 75% of approved expenditure on such extensions will be made by the Ministry.

Obituary

WILLIAM ROBINSON, M.D., M.S., F.R.C.S.

Consulting Surgeon, Sunderland Royal Infirmary

We regret to report the death of Dr. William Robinson of Sunderland, which took place at his native village of Stanhope, Co. Durham, on October 9.

Dr. Robinson was born in 1859 and had practised in Sunderland for nearly half a century. As a young man he showed great promise, and when he entered the medical faculty of the University of Durham in 1876 he secured apparently all the prizes and scholarships that were offered. In 1881 he won the Gibb, the Charlton, and the Dickinson scholarships. In that year he qualified M.B., M.S., and three years later he took the M.D. of Durham; his thesis was awarded the gold medal.

After qualification Dr. Robinson returned to Stanhope, where he interested himself particularly in the health of the workers in the lead mines, whom he found to be unduly subject to tuberculosis. At a meeting of the Independent Order of Odd Fellows in 1888 he suggested the establishment of a convalescent home for such patients, to be supported by an annual levy of a few pence from each member. His suggestion was adopted and the eventual result was the establishment of the Friendly Societies' Convalescent Home at Grange-over-Sands, which has helped many thousands of patients to recovery.

A vacancy occurring in a partnership in Sunderland, Dr. Robinson started medical practice in that town. He was a highly skilled surgeon, taking the F.R.C.S.Eng. in 1892, but as there was no surgical vacancy at the Sunderland Royal Infirmary at that time, the surgeon having been appointed for life, Dr. Robinson was elected physician but did most of the operations. Some ten years afterwards he became surgeon to the hospital, and on his retirement after long service he was made consulting surgeon, which position he held until his death. He was also in turn surgeon and consulting surgeon to what is now known as the Sir John Priestman Durham County and Sunderland Eye Infirmary, a well-appointed institution with sixty beds, but at the time he joined its staff it was a very small affair. Here he did much good work on the cataract which is the peculiar affliction of bottle finishers, one of the Sunderland trades. He was deeply interested in both these institutions, and in 1934 he published the *Story of the Sunderland Eye Infirmary*, which he set against its social and historical background. Two years later a centenary history of the Eye Infirmary also came from his pen.

As long ago as 1887 Dr. Robinson became a member of the British Medical Association. In 1898–9 he was president of the North of England Branch, and when the Association held its Annual Meeting in Newcastle-upon-Tyne in 1921 he was vice-president of the Section of Obstetrics and Gynaecology. He was also at one time president of the Northumberland and Durham Medical Society. During the war of 1914–18 he held the rank of major, R.A.M.C., and was visiting surgeon to the Sunderland War Hospital.

Last year Dr. Robinson, who was a well-read and much-travelled man, published a small autobiographical volume entitled *Sidelights on the Life of a Wearside Surgeon* (reviewed in these columns on January 6, 1940). His modest, lively narrative of the experiences of a North Country surgeon revealed a kindly personality with the gifts of shrewdness and humour well developed. He was greatly esteemed among his own northern folk. In 1934 his University conferred upon him the honorary D.Ch. He was a J.P. of the county.

N. M. J. JITTA, M.D.

The Permanent Committee of the International Public Health Office announces with great regret the death of Dr. N. M. Josephus Jitta, its distinguished honorary president, which took place last June.

Dr. Jitta had been the delegate for Holland on the committee from 1920 until early in the present year. His health had been failing for some time, and when his term of office as president of the Permanent Committee came to an end in October, 1938, he did not wish to stand again for that position, on grounds of ill-health. Dr. M. T. Morgan (British Colonies) was therefore elected in his place. Dr. Jitta had had a long and fruitful career as clinician and hygienist and as the administrative head of the health services of his country. He had held the post of president of the Council of Hygiene of the Netherlands since 1920 and had directed important researches on such questions as vaccination and post-vaccinal encephalitis. Dr. Jitta was the representative of the International Office of Public Health on the Health Organization of the League of Nations for many years, and he did much to co-ordinate the activities of the two bodies. He took a considerable part in the work preparatory to the revision of the International Sanitary Convention of 1926, especially in connexion with problems concerning the Suez Canal and the Mecca pilgrimage. In 1935 he replaced Sir George Buchanan as president of the Permanent Committee.

All those who knew Dr. Jitta personally were particularly struck by his kindly manner and by the sureness and subtlety of his judgment. His long experience of international hygiene made his advice particularly welcome to his colleagues.

The Services

MENTIONS AND AWARDS

The names of Major Douglas Cran, R.A.M.C., Captain George Fairfoul Valentine, R.A.M.C., and Captain Herbert Arthur Ledgard, I.M.S., have been brought to notice in recognition of distinguished services in the field.

Lieut.-Colonel Robert Ancel Logan, I.M.S., has been appointed an O.B.E. (Military Division) for distinguished service.

CASUALTIES IN THE MEDICAL SERVICES

Royal Navy

Prisoner of War

Temporary Surgeon Lieut. Arthur Philip Booth Waind, D.S.C., R.N.V.R.

Royal Army Medical Corps

Major Leonard Buckley, R.A.M.C., lost his life by enemy action in October, aged 54. He was born on August 12, 1886, and was educated at the University of Liverpool, where he graduated M.B., Ch.B. in 1910, also taking the M.R.C.S., L.R.C.P. After filling the posts of house-surgeon and house-physician at Liverpool Royal Infirmary he entered the R.A.M.C. as lieutenant in 1911, and became captain in 1915. He served through the war of 1914–18, and retired with a gratuity in 1921. He then settled at Wincanton in Somerset. He rejoined the R.A.M.C. as major at the beginning of the present war. He leaves a widow. He had been a member of the British Medical Association since 1921.

Prisoners of War

Lieut.-Colonel Thomas Henry Wilson, R.A.M.C.
Major John Humphrey Thornton Challis, R.A.M.C.
Major Leslie Wallace Lauste, R.A.M.C.
Acting Major Arthur Keith Gibson, R.A.M.C.
Captain Anthony Crook, R.A.M.C.
Captain (War Substantive) James David Recordon, R.A.M.C.
Lieut. John Henderson Bolton, R.A.M.C.
Lieut. Arthur Raymond Dearlove, R.A.M.C.
Lieut. Philip Athelstan Forsyth, R.A.M.C.
Lieut. Trevor Charles Noel Gibbens, R.A.M.C.
Lieut. Isaac Jacobson, R.A.M.C.
Lieut. John James Kennedy, R.A.M.C.
Lieut. Anthony Wright Camac Mellor, R.A.M.C.
Lieut. Isidore Schrire, R.A.M.C.
Lieut. Hugh Temple Tate, R.A.M.C.

DEATHS IN THE SERVICES

Lieut.-Colonel Duncan Fletcher, late R.A.M.C., T.A., lost his life at sea through enemy action in September. He was educated at the University of Glasgow and in the schools of the Royal College of Surgeons of Edinburgh, and took the Scottish Triple Qualification in 1895 and the D.P.H. in 1902.

He served for many years in the R.A.M.C., T.A., and rose to the rank of lieutenant-colonel. He had been chief district medical officer of health of the Islands and Western Inverness-shire, and medical inspector of schools, etc., for Inverness-shire. During and after the war of 1914–18 he served as officer commanding Crookston War Hospital, in charge of the neurological department of the Edinburgh War Hospital, and as medical officer of Grove Neurological Hospital. After retirement he settled at Dollar, Clackmannanshire. He had been a member of the British Medical Association for thirty-four years.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

Owing to the continued and unavoidable delay of returns for the acute infectious diseases in England and Wales publication of the full table has had to be deferred one more week.

The figures missing from the table published last week for England and Wales (deaths in brackets, including those for London where available) are: cerebrospinal fever 129, London (0); diphtheria 1,153 (37), London (2); dysentery 68; encephalitis lethargica 5, London (1); enteric fever 60 (2), London (1); erysipelas, London 34 (1); infective enteritis or diarrhoea under 2 years (35), London (5); measles 7,910 (10), London (0); ophthalmia neonatorum 116; pneumonia, influenzal, 603 (17), London 42 (2); polio-encephalitis 4, London (0); poliomyelitis 47, London (0); puerperal fever 4, London 4 (0); puerperal pyrexia 140; scarlet fever 1,755 (3), London (0); whooping-cough 1,253 (7), London (0); deaths (0–1 year) 307, London 25; deaths (excluding stillbirths) 5,742, London 1,700; live births 6,318, London 878; stillbirths 218, London 17.

With the single exception of enteric fever the incidence of the principal notifiable diseases increased during the week, especially in the case of measles, scarlet fever, diphtheria, and pneumonia; the figures for whooping-cough, cerebrospinal fever, and acute poliomyelitis were only slightly higher.

Enteric fever is the most easily controlled of the diseases mentioned, and in recent months the little-practised measure in civilians of prophylactic inoculation of T.A.B. has been used on an increasing scale in anticipation of possible pollution of water supplies by damage to mains and service pipes during air raids. Combined injections of antityphoid vaccine and tetanus toxoid are now available; reactions appear to be no greater or more frequent than when the prophylactics are given separately. Protection, so far as experience goes, is adequate, while the merits of fewer injections over shorter periods are likely to commend themselves as much to the busy practitioner as to harassed populations.

Infectious diseases characteristically spread by the upper respiratory tract are likely to be more difficult than ever to control. The dispersal of an increasing proportion of non-immunes to areas hitherto relatively free from infectious diseases in epidemic form, the close aggregation in shelters of those who remain in densely populated centres, with correspondingly greater risk of exposure to infection, and the difficulty of providing adequate isolation accommodation for cases, even for selected contacts, at a time when the majority of infections are rife, are all factors calculated to facilitate spread and defeat measures aimed at prevention and control. Therefore prophylactic inoculation against those diseases for which the method holds out some measure of success should be encouraged and made freely available either at centres already established by local authorities or by general practitioners, to whom facilities should be provided by local authorities whenever necessary. Diphtheria and measles are readily controlled by recognized prophylactics of proved efficacy, while whooping-cough and scarlet fever may be controlled actively or passively, although with less certainty of success for the individual. The use of aerosols—antiseptics, such as sodium hypochlorite, in a suitable solvent and sprayed out in minute particulate form—may well prove the answer to air-borne and droplet infection in shelters and other places where people congregate and infect each other's respiratory passages.

As regards acute poliomyelitis, the measures hitherto available, whether for prophylaxis or for treatment, have not proved themselves safe or reliable enough for general application, although for such a serious disease any method offering promise of success merits a trial under control conditions. Fortunately the disease has rarely acquired epidemic character in this country, although during each summer and autumn isolated outbreaks, occasionally of some magnitude relative to the population at risk, are recorded. This year notifications have slightly exceeded those of last year, but were much below those of 1938 and are unlikely to approximate to them. During the week notifications rose from 38 to 47. Although nineteen administrative areas were affected only six recorded more than one case, and two accounted for nearly one-half of the total. Details from areas recording more than 1 case are: Warwick 11 (Birmingham 6, Sutton Coldfield M.B. 2, Warwick M.B., Solihull U.D., Stratford-on-Avon R.D. 1 each); Lancaster 10 (Blackburn, Bolton, Salford, municipal boroughs of Chadderton, Colne, Morecambe and Heysham, Nelson, Prestwich, and urban districts of Turton and Whitworth, 1 each); Southampton 4 (in R.D. of Kingsclere and Whitchurch, New Forest, Petersfield, and Winchester); Glamorgan 4 (Cardiff, Swansea, Aberdare U.D., Penarth U.D.); Derby 2 (Matlock U.D.); Stafford 2 (Wolverhampton).

Universities and Colleges

UNIVERSITY OF OXFORD

An examination for the Theodore Williams Scholarship in Pathology, consisting of a written paper and a viva voce examination, will be held in the Sir William Dunn School of Pathology on November 10 at 2 p.m. The scholarship is open to any member of the University, whether man or woman, who on June 30 in the year of the award shall not have exceeded 26 years of age and shall have attended the course in general pathology and bacteriology in the Sir William Dunn School of Pathology either in the year of award or in the previous year. Entries must reach the Professor of Pathology before Wednesday, November 6, 1940.

UNIVERSITY OF CAMBRIDGE

Dr. James Dixon Boyd, professor of anatomy at the London Hospital Medical College, has been elected to a supernumerary Fellowship at Clare College, of which he is an ex-Fellow.

At a Congregation on October 22 the following medical degrees were conferred by proxy:

M.D.—R. W. D. Turner.
M.B., B.CHIR.—J. D. Kidd, B. L. F. Heydon.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

The annual meeting of Fellows and Members has been called for Thursday, November 21, at 3 p.m., when a report from the Council will be laid before the meeting. Copies of this report can be obtained beforehand on application to the secretary. Motions to be brought forward at the meeting must be signed by the mover, or by the mover and other Fellows and Members, and must reach the secretary not later than November 11. A copy of the agenda will be issued on or after November 16 to any Fellow or Member who might apply for one.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the requisite examinations, have been admitted L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P. & S.Glas.:

H. Baddeley, M. C. Bell, H. Bernstein, T. B. Binns, D. S. Bomson, T. Brittain, A. G. Buick, D. E. T. Donaldson, M. D. Evelyn, L. Feld, A. J. Friedman, A. P. Govender, A. Greenberg, J. J. Greenwald, E. Grossman, N. S. Handman, M. E. Haut, I. F. K. Hughton, B. Hurewitz, J. Israel, P. G. McE. G. Jones, S. Katz, M. J. Kelly, H. H. Kirk, A. M. Kumaraswamy, J. Kupchan, D. J. Livingstone, B. Levy, L. London, A. McAllister, E. W. Magill, Elizabeth D. Mercer, R. C. Nirsimloo, G. Novis, Agnes W. B. F. O'Gorman, S. Osroff, F. Pomerantz, M. I. I. Rajah, C. E. K. Ratnam, J. A. Reid, I. Robins, B. Ross, W. L. Schiffman, J. Siegel, M. N. Sholtzow, P. Snell, A. I. Swiller, Helen E. Swiller, M. P. Taff, M. E. Vawda, W. A. White, P. Wiesenfeld, D. L. Ziselman.

The following graduates of recognized foreign universities were also admitted licentiates:

W. B. Ehrmann, E. Forrai, E. Goldsmith, A. Horowitz, R. Posner, I. E. Reichenfeld, Marianne H. Weigert.

Medical Notes in Parliament

Quality of Milk

In a discussion on food production in the House of Commons on October 22 Mr. ERNEST BROWN, Secretary of State for Scotland, said that the Government wanted the maximum production of the food which was required to maintain the health of the nation. In recent years a great deal of thought had been given to the problems of the health and strength of the nation, especially to nutrition. Not only had medical committees considered the question, but the Government had been advised about it. There were foods that were vital and those that were supplementary. Among the vital requirements were bread, milk, potatoes, oatmeal, vegetables, and fats. Answering an interjection about meat, Mr. Brown said that meat might come among the other desirable things but not in the category of vital foodstuffs. No scientist imagined that one could keep a nation healthy and strong merely in terms of calories. One must have regard to other things: first of all to the habits of the people and the foodstuffs they liked, as well as to the things which the scientists said were good for them. Not even the most abstract of scientific arguments could be without regard to the effect of any advice, given in these terms, on the whole agricultural economy of the country. The Government had done its best to encourage the production of milk, to which it attached the highest importance.

Mr. DAVID ADAMS said that the Ministry of Agriculture had not yet devoted its attention to the quality of milk. The milk farmer could ignore all questions of hygiene and the health of his consumers. There was a certain quantity of milk, known as undesignated, which was described by medical officers of health as being unfit, in its present state, for human consumption; yet it was produced, and no serious attempt had been made to bring the farms concerned up to the proper standard. We were receiving about 40% of our milk from these farms, and it was unquestionably a jeopardy to the health of the community. It contained excremental pollution, which could be discovered in a casual way on the farm, and it certainly contained pathogenic organisms which were responsible for tuberculosis and other disease. Much more intensified instruction might be given to farmers who were not producing the standard of milk which the Ministry required. If the Minister would say that this matter, which hitherto had unquestionably been neglected, would receive his attention and consideration, then he (Mr. Adams), the medical officer of health, and others would be satisfied. Very stern action should be taken to bring the standards up to what they ought to be.

Sick Bays in Shelters

On October 24 Mr. SORENSEN asked the Home Secretary if he was securing that certain basement and underground shelters should be adapted for use as maternity or general hospital purposes. Mr. HERBERT MORRISON replied that arrangements were being made by the Minister of Health whereby a sick bay would be provided in the largest shelters and a doctor would be on call when required.

Mr. Morrison also informed Mr. Lindsay that medical officers of health of the metropolitan boroughs were fully co-operating in the inspection of air-raid shelters with the medical officers of the Ministry of Health specially assigned for this purpose. Arrangements for the employment of additional doctors were not yet complete, and he could not at present say how many had been provided in the Greater London area.

Supply of Medical Personnel

Mr. GROVES, on October 24, asked what steps had been taken under Regulation 58A of the Emergency Powers (Defence) General Regulations regarding medical practitioners; who were the senior officers of the Ministry of Health and of the Department of Health for Scotland he had appointed for such purpose; what was their particular experience; what were their other official duties and activities; and if he would consider obtaining the co-operation of the Medical Practitioners' Union. Mr. MACDONALD said that no occasion had so far arisen for the exercise in regard to medical practitioners of the powers referred to. The Ministry of Labour had appointed to be National Service Officers for this purpose the assistant secretaries to the Ministry of Health and the Department of Health for Scotland, who were responsible for the administration of matters relating to the supply of medical personnel. The Government were advised on these matters by the Central Medical War Committee, which in the opinion of the Government adequately represented the interests of the medical profession as a whole. He therefore saw no reason to invite the views of the Medical Practitioners' Union in particular.

Mental Health of Recruits

On October 24 Mr. LIPSON asked the Minister of Labour if medical boards gave attention to the mental health of the men registered for military service. Mr. BEVIN said that the investigation of a man's mental condition was an important part of the examination by medical boards and was a matter on which they had recently received further directions on the recommendation of the Medical Advisory Committee under Lord Horder's chairmanship.

Medical News

The Minister of Food has appointed the following committee to consult with the Ministry on the administrative and technical questions associated with the proposed addition of vitamin B_1 and calcium to white flour: Mr. H. D. Vigor (chairman), Mr. Edmund B. Bennion, M.Sc., Mr. W. Bloor, Prof. E. C. Dodds, D.Sc., Mr. T. H. Hodgson, Prof. R. A. Peters, F.R.S., Mr. J. Arthur Rank, Mr. Arthur Robinson, and Dr. J. Sword.

The date of the examination for the Theodore Williams Scholarship in Pathology is Saturday, November 9, and not November 10 as announced.

To meet the need for central direction and co-ordination of medical questions arising at the Royal Ordnance factories and other Government establishments Air Vice-Marshal Sir David Munro has been appointed Chief Medical Officer of the Ministry of Supply.

The Chadwick Trustees are offering two prizes, one of £100 and the second of £50, for the best two essays on the construction and management of air-raid shelters, with special reference to ventilation, heating, sanitation, and the provision of sleeping accommodation. Information in regard to the prizes and conditions of the award can be obtained by sending a stamped addressed envelope to the Clerk to the Chadwick Trustees, 204, Abbey House, Westminster, S.W.1.

In a broadcast talk on October 29 Mr. Malcolm MacDonald, Minister of Health, spoke of the effect on public health of overcrowding in air-raid shelters and of the arrangements already made to counter the risk of epidemics during the winter months as a result of the abnormal conditions. Many steps, he said, were being taken to provide against the attacks of parasites and infectious diseases, and the understanding and co-operation of the public could do much to help. Dealing with the provision of medical aid posts in large shelters, he said that these would be equipped to attend not only to cases of accident but to serious headaches, earaches, and the minor ailments that might be aggravated by shelter life. There would be a nurse in regular attendance and a doctor either in residence or on call.

A new edition of the Memorandum on Cerebrospinal Fever among troops has just been issued by the Army Medical Directorate, War Office. In particular this memorandum brings up to date the treatment of the disease by chemotherapeutic agents and the policy now adopted in respect of the swabbing of contacts.

The Lord Mayor of London's air-raid distress fund now amounts to well over £1,300,000.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.
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B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Disfigurement of Nails

"DIGIT" writes: Could any of your readers give assistance with the following case? The patient is a young bank official in his early twenties. About five years ago he noticed that his finger and toe nails were becoming rough and brittle, and now all his nails are furrowed, thick, and constantly breaking off at the distal end. There is no pain, and his sole complaint is that they are very unsightly. He has seen a specialist, who tried various remedies, including *x* rays, but all without any real benefit. One nail was even removed, but the new nail was as bad as ever; otherwise he is quite healthy.

"Only Functional"

"L. P. S." writes: Your correspondent writing under the heading "Only Functional" (August 17, p. 244) will find the diagnosis of his case in an article called "Some Alarming Seizures," by Prof. John A. Ryle, published in the *British Medical Journal* of January 20, 1934.

Bromidrosis of the Feet

"G. B. F." writes: In reply to "A. D.'s" query for a remedy for bromidrosis (October 5, p. 478). When acting as a civilian medical practitioner at a military hospital, all the known remedies having failed in a bad case and also all the treatment advocated by Continental armies, I tried a course of ultra-violet rays. This was immediately successful, and since then I have advised sufferers from the complaint to expose their feet to graduated doses of sun rays until the feet are pigmented ; this is simpler and quite as effective.

Income Tax

Board of Locumtenent

"C. D." points out that while a locumtenent receives free board and lodging under his principal's roof he is not liable to tax on the value thereof to him. If so, why should his income tax be increased because the principal for private reasons makes a change and gives him an additional £2 per week to board himself?

*** The value of board and lodging provided cannot be turned into money by the recipient, therefore on a technical argument it is exempt from taxation. On the change referred to above "C. D." reverted to the position in which the ordinary taxpayer finds himself—liable to pay tax on the income out of which he provides for his own maintenance.

Payment in Kind

"D. R." has some patients who have asked if they can pay their accounts in goods instead of in cash. Would receipts of this kind be liable to income tax?

*** Yes—but they should be reckoned at the amounts of cash which "D. R." could obtain for the goods—presumably less than their normal retail value.

Personal Allowance

"R. A." has been assessed on £243 earnings, with deductions for expenses and earned income relief but not for the married personal allowance or for his child. The assessment is for 1939–40.

*** Unless the latter allowances are being given for the same year against some other income, "R. A." is entitled to have them deducted in this assessment. The fact that other allowances have been given suggests that "R. A." has made his return, in which case either he has had his allowances elsewhere or an error has been made in the inspector's office, which will no doubt be corrected if attention is drawn to it.

LETTERS, NOTES, ETC.

L.C.C. Ambulance Service: Telephone Calls

With reference to applications by telephone for the use of ambulances for the conveyance of cases of illness, we are asked to inform readers that if Waterloo 3311 is unobtainable at any time the alternative numbers Whitehall 2177 or Waterloo 6687 should be used. Applications in connexion with street accidents and emergencies should continue to be made by dialling "999."

First Aid for Burns

"A. B." writes: I have read with great interest Mr. J. L. Aymard's letter on first aid for burns (August 3, p. 167). I have practised his method for quite a number of years with excellent results. It was brought to my notice by a Viennese housewife, who used to dip her finger in white of egg if she burned her fingers while working in the kitchen. If that was done immediately no blisters appeared. I have since used egg albumen in many cases of burns, and it never failed to help if applied a short time after the accident.

"Typhoid Mary"

"Typhoid Mary," who died in 1938, will probably be heard of for many years yet, and those who wish to have an accurate record of her life will find it in the *Bulletin of the New York Academy of Medicine*, October, 1939, under the title of "The Curious Career of Typhoid Mary," by Dr. George A. Soper, who wrote the first account of Mary Mallon in the *Journal of the American Medical Association*, June 15, 1907. A reprint of Dr. Soper's article is in the library of the B.M.A.

Ingrowing Toenail

"ARCHICLAST" writes: This condition is the result of pressure of a keratinous arch by its footings or lateral edges into the sensitive underlying tissues or quick. Pressure by footwear reinforces the arch, and the natural growth forward of the nail so pressed in adds a ploughing effect to the agony. The above definition indicates the main requirement for cure, which is to break the arch, and for prevention, which is to keep it broken. Dr. Prentice's rather painful method (August 24, p. 274) breaks the crown of the arch in its forward part, and will give temporary relief, while the sensitive quick remains exposed. The following simple operation undermines both springs of the arch without touching or exposing the quick, and may be said to be good for a lifetime. It consists in making two well-defined grooves along the length of the nail so as to mark off from its central two-thirds two lateral parts or "wings" (of one-sixth each) which remain hinged to it by the underlying membrane after the manner of Gooch splinting. Scraping with the corner of a one-edged razor-blade is as good a method as any for making the grooves. As a preliminary the sites for grooves may be marked in pencil. Once started the patient usually can be trusted to complete the grooving, taking care to desist when the scraping begins to hurt, showing that the right depth has been reached—that is, only a thin film of keratin remains in the invert of the groove. As a finish a little manipulation of the wing-pieces will exercise their hinges. The arch thus broken, the resistance of the suffering tissues soon bends up its footings—the offending wings. After-care rests with the patient. He should keep the nail trimmed close, but cut flush across all three sections, resisting the temptation to lop off the looser ends of the wings. The grooves are prolonged into the new growth of nail as it appears, and if they go askew fresh grooves should be made in the correct position.

A Word of Caution

We are informed by a correspondent practising in North-West England that he recently had a visit from a lady who described herself as a Norwegian radiologist and asked for a loan until her money came through. She was able to give the names and addresses of various Norwegian residents, but as on inquiry she proved to be unknown to them our correspondent suggests that if other members of the profession receive a similar request it might be wise to test this lady's bona fides before giving the assistance asked for.

Corrigendum

In the leading article on pregnandiol (October 26, p. 561) two reference numbers were incorrectly given in the text. The sentence beginning "Venning and Browne[6 7]" should read "Venning and Browne[7 8]".